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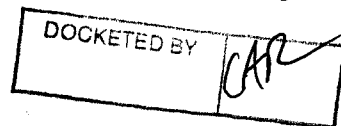
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 LIZÁRRAGA, ROBLES, TAPIA Y CABRERA S.C.
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July 11, 2003

Colleen Ryan, Supervisor
 Document Control Center
 Arizona Corporation Commission
 1200 West Washington
 Phoenix, Arizona 85007

Arizona Corporation Commission
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Re: Mesquite Project CEC
 Decision No. 63232; Case No. 101
 Docket No. L-00000-00-0101

Dear Ms. Ryan:

Enclosed for filing in the subject docket are copies of the following materials relating to Mesquite Power Plant, LLC's compliance with the conditions set forth in the Certificate of Environmental Compatibility granted to it by Decision No. 63232.

- 1) A June 20, 2003 letter from Prem Bahl of the Commission's Utilities Division to the undersigned;
- 2) A June 27, 2003 letter from the undersigned to Mr. Bahl; and
- 3) A July 11, 2003 letter from the undersigned to Mr. Bahl, together with Appendices "A," "B," and "C."

The enclosed materials are of informational nature, and do not require further action.

Colleen Ryan, Supervisor
July 11, 2003
Page 2

Thank you for your assistance.

Sincerely,

A handwritten signature in cursive script that reads "Lawrence V. Robertson, Jr.".

Lawrence V. Robertson, Jr.

LVR:cl

cc: Prem Bahl, Utilities Division
Jason Gellman, Legal Division
Mesquite Power Plant, LLC

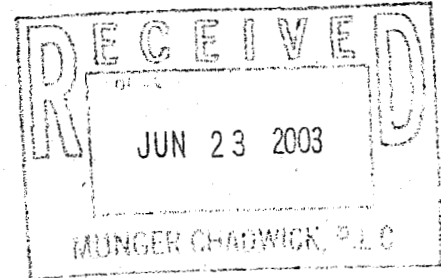
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Interim Executive Secretary

ARIZONA CORPORATION COMMISSION

June 20, 2003



Mr. Lawrence V. Robertson
Munger Chadwick, P.L.C.
333 North Wilmot, Suite 300
Tucson, Arizona 85020-2634

RE: Certificate of Environmental Compatibility for the Mesquite Project
(Docket No. L-00000-00-0101; Case No. 101; Decision No.63232)

Dear Mr. Robertson:

This letter follows up the phone conversation Jason Gellman and I had with you on June 17, 2003, in regards to the above noted Certificate of Environmental Compatibility (CEC) compliance issues. I shared with you my discussion with Marty Swartz, Project Manager, on June 16, 2003, regarding these compliance issues. I acknowledged to him the receipt of documents filed by him in the Docket Control in February 2003, in response to Condition Nos. 6 and 7 of the CEC (executed interconnection agreement and a copy of the WECC Reliability Management System Generator Agreement). He had informed me that the Company had also filed the annual report in Docket Control earlier this year in response to Condition No. 12 of the CEC, describing the status of implementation of the Comprehensive Land Management Plan. I pointed it out to him that, to my knowledge, the Applicant had not complied with CEC Conditions No. 4 (submission of Technical Study before commercial operation); No. 5 (demonstrating satisfaction of WECC (N-1) criteria without any remedial action); and No. 8 (participation in the Southwest Reserve Sharing Group). You said you were going to look into these compliance issues and get back with us soon.

In our discussion, it was pointed out that, according to the referenced Commission Decision, the Findings of Fact No. 5 states, "... Mesquite has agreed to have wholesale power available during peak periods, during the first two years following commercial operation, for sale to Arizona customers in open market, arms-length transactions." As I learned from Marty Swartz, the output of the First Block (440 MW) was being sold to the California Department of Water Resources (CDWR). Please provide the date the contract was signed by CDWR and why Semptra chose to not bid in the Track "B" competitive solicitation process. Please explain how the contract complies with the referenced Findings of Fact No. 5.

Although not required as a condition in the CEC, Mesquite is requested to provide information in the form of an annual certification letter to the Commission showing status of compliance with all conditions in its CEC, as has been required by the Commission in CEC's approved by the Commission since January 3, 2002. Please advise when you intend to do so.

Mr. Lawrence V. Robertson
June 20, 2003
Page 2

Your response to the above questions and the Applicant's compliance status with the aforementioned conditions by July 1, 2003, would be much appreciated.

Sincerely,



Prem Bahl
Electric Utilities Engineer
Utilities Division

PKB:hml

cc: Marty Swartz
Semptra Energy Resources
101 Ash Street
San Diego, CA 92101

Jason Gellman
Brian Bozzo
Case No. 101 File

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June 27, 2003

Prem Bahl
Utilities Division
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

Re: Mesquite Project CEC
Decision No. 63232; Case No. 101
Docket No. L-00000-00-0101

Dear Mr. Bahl:

This letter will acknowledge my receipt on June 23, 2003 of your letter of June 20, 2003 regarding the above-referenced matter. In your letter, you indicate that you would like to receive the requested information by July 1, 2003. To the best of my recollection, Mr. Gellman, you and I did not discuss that particular response date during our joint telephone conference on June 17, 2003, nor any other specific date.

In any event, due to pre-existing commitments and other demands on our respective schedules, the July 1, date does not afford Mr. Swartz and me sufficient time to confer before Mesquite's responses are finalized and submitted. When I became aware of that fact, I telephoned Mr. Gellman earlier this week and so informed him. In that regard, Mr. Swartz and I anticipate that Mesquite's responses and information will be submitted no later than July 10, 2003.

As you will recall, Decision No. 63232 does not contain an "annual certification" condition. That concept was first adopted by the Commission approximately a year later in Decision No. 64356 (Case No. 111). Further, only 4 of the 12 conditions contained in Decision No. 63232 have indicated response dates, and Mesquite has previously satisfied 3 of those 4 conditions. Thus, hopefully the receipt of Mesquite's responses by July 10 will not inconvenience you or your colleagues.

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Prem Bahl
June 27, 2003
Page 2

Please let me know in the event you have any questions.

Sincerely,

A handwritten signature in dark ink, appearing to read "Lawrence V. Robertson, Jr." with a stylized, cursive script.

Lawrence V. Robertson, Jr.

LVR:cl

cc: Jason Gellman - ACC Legal Division
Marty Swartz

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(LICENSED SOLELY IN MEXICO)

July 11, 2003

Prem Bahl
Utilities Division
Arizona Corporation Commission
1200 West Washington
Phoenix, Arizona 85007

Re: Mesquite Project CEC
Decision No. 63232; Case No. 101
Docket No. L-00000-00-0101

Dear Mr. Bahl:

This letter and the enclosed materials are in response to the several requests set forth in your June 20, 2003 letter to me regarding the above-referenced matter. As such, they also supplement my June 27, 2003 letter to you. For your convenience, the following discussion addresses each request in the sequence in which it was raised in your letter.

CEC Condition No. 4:

As you may be aware, the owners of the Palo Verde power plant and the Salt River Project ("SRP"), in its capacity as operator of the Palo Verde Transmission System, decided to conduct two separate studies of transmission capacity for merchant power plants connecting with the Palo Verde Hub. The first study analyzed the effect of plants coming into service in 2002, which were the Red Hawk and the Arlington Valley plants. The second study analyzed the effect of plants coming on line in 2003 and thereafter, which included the Mesquite power plant. This distinction in study scope was made in order to account for the fact that a new transmission line (PV-Rudd 500 kV line) would be coming into service in 2003. The participants in the latter study were known as the Palo Verde/ Haasayampa Interconnectors Study Group, and Mesquite was an active member.

Prem Bahl
July 11, 2003
Page 2

The original Palo Verde/ Haasayampa Interconnectors Study, which was completed in March 2001, determined that the "maximum power that can be scheduled out of Palo Verde vicinity to all areas is about 6750 MW." Operating studies which have been conducted since 2001 have determined the amount of outlet capability on the Palo Verde Transmission System for each succeeding season. Attached as Appendix "A" to this letter is a copy of the latest seasonal study prepared by SRP ("2003 Summer Palo Verde Transmission System Operating Study Report"), which includes the new PV-Rudd 500 kV line that went into service on June 1, 2003. This study determined that the outlet capability this summer is 9,595 MW. This total includes the three Palo Verde nuclear units of 3,861 MW and an additional 5,734 MW of net generation which accommodates Mesquite Block 1 & Block 2 among others. As you will note in that regard, the study also determined that no Remedial Action Schemes ("RAS") or arming for generation tripping are needed under no-outage (N-0) conditions.

Under the aforementioned circumstances, Mesquite as a practical matter was not in a position to conduct an independent study confined to the effect of the Mesquite plant on available transmission capacity. Thus, it did not undertake to do so. The most recent seasonal study was not completed until May, 2003, or approximately two months after Mesquite Block 1 was placed into service.

We believe that this submittal satisfies the intent of CEC Condition No.4. In retrospect, we could have provided you with a copy of the seasonal study completed early last summer. However, it was anticipated that the available transmission capacity would (and, in fact, did) change during the ensuing year with the placement in service of the PV-Rudd 500 kV line. Thus, the earlier study data would have been of little practical value for purposes of Mesquite's CEC. We apologize for any inconvenience that the delay in transmitting the enclosed data may have caused.

CEC Condition No. 5:

Attached as Appendix "B" is a copy of the "2003 Summer Palo Verde Transmission System Initially Out of Service Supplementary Operating Study Report," as completed by SRP in June, 2003. The Mesquite project participated in this joint study as well, and did not undertake to conduct an independent study.

As you are aware, the Western Systems Coordinating Council became the Western Electric Coordinating Council ("WECC") since Decision No. 63232 was issued. In order to meet the WECC criteria for single contingency outage (N-1) conditions, seasonal operating studies are conducted to determine system impacts with a major line initially out-of-service. For specific lines initially out-of-service, RAS to trip generation will be required. The levels of generation arming for the specific contingencies are summarized in the attached report.

We believe that this submittal satisfies CEC Condition No. 5.

CEC Condition No. 8:

Subsequent to the issuance of Decision No. 63232, Mesquite investigated membership in the Southwest Reserve Sharing Group ("SRSG"). That investigation disclosed that SRSG is designed for participation by utilities that operate control areas, and does not easily accommodate participation by independent power producers. This is particularly so for an independent power producer with only one generating facility in the area. In order to participate under SRSG's current membership criteria, Mesquite would have to provide reserves of its own to satisfy its SRSG obligation in the event that the Mesquite facility should trip. SRSG does not provide a pool or "market" for such reserves. Moreover, SRP does not offer operating reserves as a part of its control area services. Furthermore, at present Mesquite does not have any firm power sales contracts with Arizona customers. Thus, under these circumstances, Mesquite concluded that it would not be "commercially reasonable" to become a member of SRSG at this time.

CEC Condition No. 8 embodies a "commercially reasonable efforts" standard. Mesquite believes that it has exerted those efforts contemplated by this condition. SRSG has indicated to Mesquite that SRSG is "indifferent" as to whether Mesquite becomes a member. In addition, SRSG has stated that it has no plans at this time to make changes in its membership criteria which would facilitate participation by merchant generators such as Mesquite. Mesquite is receptive to the concept of membership in SRSG under "commercially reasonable" conditions, and will further explore that prospect if its future operating circumstances in Arizona or SRSG's future membership criteria so warrant.

Finding of Fact No. 5:

Finding of Fact No. 5 in Decision No. 63232 notes that

" . . . Mesquite has agreed to have wholesale power available during peak periods, during the first two years following commercial operations, for sale to Arizona customers in open market arms-length transactions." [page 2, lines 6.5-8]

Mesquite has done just that to date, and continues to do so.

Prem Bahl
July 11, 2003
Page 4

More specifically, Mesquite has been engaged in bilateral negotiations with both Arizona Public Service Company ("APS") and SRP during the past year and one-half with regard to possible sales of power from the Mesquite facility. No definitive agreements have been reached to date, but discussions with both APS and SRP are continuing. In addition, Mesquite has offered to make power from its facility available as a potential physical hedge in support of any sales arrangements in Arizona that its non-utility affiliates (Semptra Energy Trading and Semptra Energy Solutions) may consummate. In this regard, Semptra Energy Solutions is currently planning to respond to an RFP issued by the San Carlos Irrigation District.

Mesquite (and Semptra) did not submit a proposal in the recently concluded initial Track "B" competitive solicitation process for the reasons set forth in Semptra's letter to the Independent Monitor, a copy of which is attached to this letter as Appendix "C."

Finally, you are correct in your understanding that power and energy generated at Mesquite Block 1 are currently being sold to the California Department of Water Resources ("CDWR") under a May, 2001 contract between Semptra and CDWR. However, the Mesquite power plant is not dedicated to support that contract. Rather, under the agreement, Semptra has the discretion and latitude to fulfill its supply obligations to CDWR from any of the several power resources available to it. Thus, the Mesquite facility remains available to satisfy the commitment noted in Finding of Fact No. 5.

Status of Compliance as to Other CEC Conditions:

As you correctly note in your June 20, 2003 letter, and as further discussed in my June 27, 2003 letter to you, Decision No. 63232 did not impose an "annual certification letter" condition or requirement as a part of the CEC granted to Mesquite. However, and as noted in my June 27, 2003 letter to you, Mesquite is quite willing to provide such information on a voluntary basis.

Mesquite currently anticipates that its first filing of that nature will be made on or about September 1, 2003. In that regard, Mesquite proposes that all subsequent annual filings be made on November 1 of each year, which is the date on which Mesquite submits the annual report required by CEC Condition No. 10 regarding the status of its implementation of the Comprehensive Land Management Plan. In this manner, Mesquite could provide the Commission and its staff with a comprehensive overview of Mesquite's compliance as to all aspects of its CEC at a single point in the year. In the event any compliance activities should occur between September 1, 2003 and October 31, 2003, Mesquite will file an updated description on November 1, 2003.

Prem Bahl
July 11, 2003
Page 5

Conclusion:

We believe that this letter and the attached materials are fully responsive to the requests set forth in your June 20, 2003 letter to me. In the event that you should have any questions, please call Marty Swartz at (619) 696-2943 or me at (520) 721-1900.

Sincerely,

A handwritten signature in cursive script, reading "Lawrence V. Robertson, Jr.".

Lawrence V. Robertson, Jr.
LVR:cl

cc: Jason Gellman, Legal Division
ACC Document Control Center
Marty Swartz

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APPENDIX "A"

2003 Summer Palo Verde Transmission System Operating Study Report

By

James C. Hsu

Salt River Project

May 6, 2003

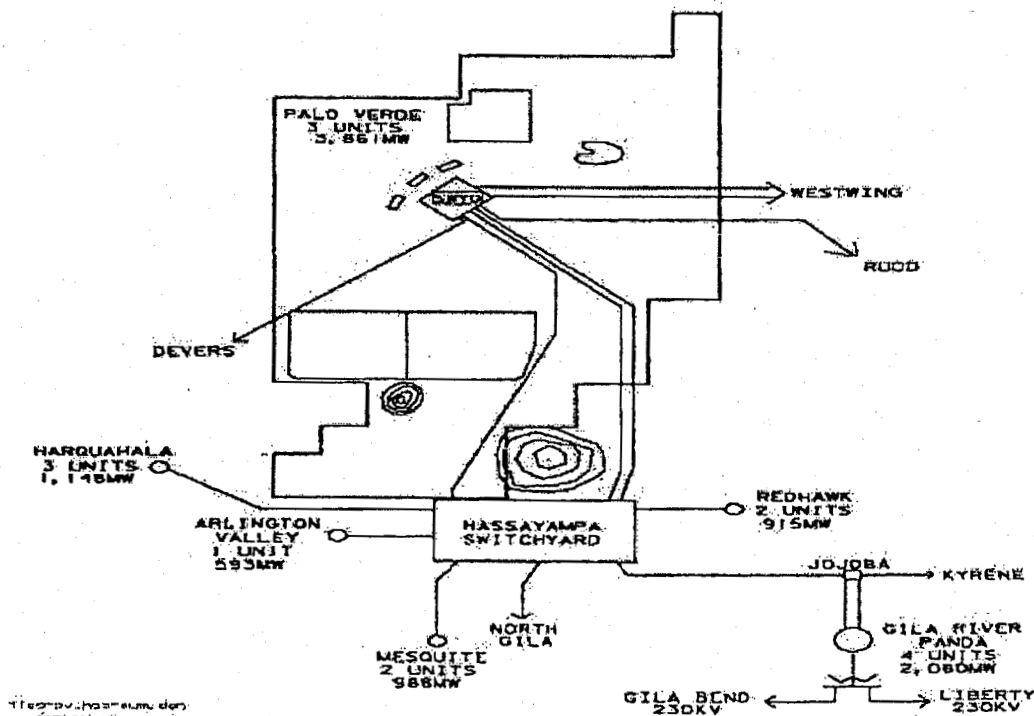
Version (A)

2003 Summer Palo Verde Transmission System Operating Study Report

I. Introduction

This report documents a study to determine the simultaneous Palo Verde Transmission System (PVTs) operating limits due to adding new generating units from the PVTs Interconnectors and a new 500 kV transmission line for the summer of 2003. In early June 2003, APS will complete construction of the new Palo Verde-Rudd 500 kV line. The Palo Verde-Rudd 500 kV line is a joint APS/SRP project to interconnect between the Palo Verde Switchyard and the Rudd Receiving Station in the southwest valley and to serve the Phoenix area load. The line is about 37 miles long. The new transmission configuration is shown in Figure A below.

FIGURE A
PALO VERDE/HASSAYAMPA STATION
SITE AND 500KV TRANSMISSION LINES



Beginning in June 2003 and throughout summer 2003, more new generating units, which include a second Mesquite unit (499MW) and a fourth Panda Gila River unit (520MW), will be available for service in addition to the generation studied for the 2003 spring case. The generation capability of these PVTs Interconnectors and the preliminary synchronization dates for the new units are shown in Table A.

- Adding the second Mesquite unit (2-CTs and 1-ST) with net generation at 499 MW.
- Adding the third Harquahala unit (1-CT and 1-ST) with net generation of 384 MW.
- Adding the fourth Panda Gila River unit (2-CTs and 1 ST) and 1 ST of the third unit with net generation of 740 MW.

II. Summary of Results and Conclusions

The 2003 summer operating nomograms are shown in Figure 1 of Appendix A. The detailed results are summarized in the Table 1 thru Table 7 of Appendix B. The significant conclusions drawn from these study results are listed below:

1. The Palo Verde Transmission System thermal capability is limited to a total net generation of 9,595 MW. This includes three Palo Verde units generating 3,861 MW and the addition of net generation up to 5,734 MW, which includes one Arlington unit (593 MW), two Red Hawk units (915 MW), two Mesquite units (998 MW), three Harquahala units (1,148 MW) and four Gila River units (2,080MW).
2. The thermal limits were at both the Hassayampa-North Gila line (99.9% of the line series capacitors continuous rating), and the Hassayampa-Jojoba-Kyrene line (100.0% of the breakers and disconnect switches continuous rating) under the base case conditions.
3. For a single-line-to-ground fault at the Palo Verde 500 kV bus and subsequent loss of two Palo Verde-Westwing 500 kV circuits, no significant stability problem was found with a net generation of 9,595 MW. This generation limit of 9,595 MW at the PVTs thermal limits is not restricted by the net reactive power flows up to a maximum bucking of 800 MVARs measured at the Palo Verde/Hassayampa 500 kV Common Bus. Therefore, no operating nomogram is required for this specific N-2 outage.
4. The most severe fault is an outage of the Hassayampa-North Gila 500 kV line resulting from a three-phase four-cycle clearing fault at the Hassayampa 500 kV bus. Certain operating nomograms depending upon the Palo Verde operating voltage levels and the net reactive power flows at the Palo Verde/Hassayampa 500 kV bus are required.
5. With the Palo Verde/Hassayampa 500 kV bus operated at 530 kV, the stability limit is 9,595 MW with a reactive power bucking restriction. This 9,595 MW is only attainable if the Palo Verde/Hassayampa 500 kV Common Bus is being bucked no more than 370 MVARs. A generation curtailment of 384 MW is necessary if a maximum Palo Verde/Hassayampa 500 kV Common Bus bucking at 800 MVARs. Existing Remedial Action Scheme (RAS) is not applicable to this outage.
6. The stability limit and transient voltage dip become more critical if the Palo Verde/Hassayampa 500 kV Common Bus operated at 525 kV. The generation limit of

Salt River Project

maximum boosting modeled for each Palo Verde unit was 600 MVARs. The base case was created to study conditions representing north to south transfer on the COI in the range of about 4,000 MW, which is typical for the summer operating time frame. Version 12 of the GE PSLF program was used for the evaluation. The power flow and transient stability evaluation used this new base case.

The following are the series compensation in the major EHV transmission lines in the Arizona/New Mexico sub-region.

<u>Transmission Line</u>	<u>Compensation Level (%)</u>
Four Corners-Moenkopi 500 kV	0.0
Four Corners-Cholla 345 kV	25 each
Cholla-Pinnacle Peak 345 kV	0.0 each
San Juan-McKinley 345 kV	30 each
Cholla-Saguaro 500 kV	36
Four Corners-West Mesa 345 kV	34
San Juan-BA 345 kV	34
Springerville-Greenlee 345 kV	37
Springerville-Luna 345 kV	26
Springerville-Vail 2 345 kV	38
Greenlee-Vail 345 kV	28
Navajo-Crystal-McCullough 500 kV	72
Navajo-Moenkopi 500 kV	70
Navajo-Westwing 500 kV	40
Moenkopi-Yavapai 500 kV	43
Yavapai-Westwing 500 kV	28
Moenkopi-Eldorado 500 kV	72
McCullough-Victorville 500 kV	35 each
Eldorado-Lugo 500 kV	35
Mohave-Lugo 500 kV	26
Mead-Liberty 345 kV	70
Eldorado-McCullough 500 kV	0.0
Palo Verde-Devers 500 kV	50
Palo Verde-Miguel 500 kV	50
Perkins-Mead 500 kV	70

The following were the maximum generation levels represented in the study for the PVNGS and the PVTs Interconnectors:

Palo Verde (3 units) = 3,861 MW
Hassayampa (12 units) = 5,734 MW, which consists of the following:
Arlington (1 unit) = 593 MW
Red Hawk (2 units) = 915 MW
Mesquite (2 units) = 998 MW
Harquahala (3 units) = 1,148 MW
Gila River (4 units) = 2,080 MW

D. Transient Stability Study Criteria

1. All machines in the system shall maintain synchronism as demonstrated by their relative rotor angles.
2. System stability is evaluated based on the damping of the relative rotor angles and the damping of the voltage magnitude swings.
3. Transient voltage dips at Palo Verde 500 kV bus and other major critical buses shall not exceed 30% following major disturbances. For N-1 single contingency, the Devers 230 kV bus (the load bus) shall not exceed 25% voltage dip. However, some other bus voltage dips in excess of this criteria value can be considered acceptable if they are acceptable to the affected system or fall within the affected system's internal design criteria.
4. Unit tripping of new generation shall not exceed 2,704 MW.

E. Study Methodology

1. The first step is to determine the maximum amount of generation that can be accommodated by the Palo Verde Transmission System thermal capability. The next step is to determine the stability limit with respect to the Palo Verde/Hassayampa 500 kV Common Bus reactive power flow restrictions. The requirements for generation curtailment and/or unit tripping shall be also developed if necessary.
2. The second step is to determine if the stability limits, other than those in step 1, exist based on the maximum generation schedules at the transmission thermal limits. If the stability limits exist, the requirements for either generation curtailment or unit tripping (RAS) shall be also determined if necessary.
3. The last step is to develop the appropriate operating nomogram limits according to the most critical limiting conditions with respect to the ranges of reactive power flows up to 800 MVARs bucking measured at the Palo Verde/Hassayampa 500 kV Common Bus.

V. Discussion of Study Results

1. **Power Flow Limits With Maximum Generation On-Line:**
(See Table 1 for detailed study results)

(A) N-0 Base Case Conditions

The power flow base case was modeled with a total net generation of 9,595 MW by all of the PVTs Interconnectors with the addition of new generation up to approximately 5,734 MW, which includes one Arlington unit (593 MW), two Red

Exhibit 1: Normal Reactive Power Boosting Conditions

Reactive Power Control Techniques	Reactive Power Participation By	Stability Results	Transient Voltage Dip
(1) PVNG Units Solely Control	PVNG=+1079 MVAR HAA=-495 MVAR NET=+584 MVAR	Very Stable No Limit	Palo Verde 500 kV: 8.0% Devers 230 kV: 9.0%
(2) Both PVNG & HAA Joint Control (Sensitivity)	PVNG=+545 MVAR HAA=+48 MVAR NET=+593 MVAR	Very Stable No Limit	Palo Verde 500 kV: 8.0% Devers 230 kV: 10.0%

Exhibit 2: Maximum Reactive Power Bucking Conditions

Reactive Power Control Techniques	Reactive Power Participation By	Stability Results	Transient Voltage Dip
(1) PVNG Units Solely Control	PVNG=-298 MVAR HAA=-503 MVAR NET=-801 MVAR	Stable No Limit	Palo Verde 500 kV: 18.0% Devers 230 kV: 14.0%
(2) Both PVNG & HAA Joint Control (Sensitivity)	PVNG=-830 MVAR HAA=+28 MVAR NET=-802 MVAR	Stable No Limit	Palo Verde 500 kV: 18.0% Devers 230 kV: 15.0%

(ii) **The Palo Verde/Hassayampa Switchyard Operated at 525 kV**
(See Table 2 for detailed results)

It is important to evaluate a lower operating voltage at 525 kV for the PVTS to ease the concern of yielding a conservative stability result. The results are tabulated below in Exhibit 3 and Exhibit 4, which indicated that the change of Palo Verde/Hassayampa operating voltage was found to have a negligible impact on this specific N-2 stability results for two operating conditions studied.

Exhibit 3: Normal Reactive Power Boosting Conditions

Palo Verde/Hassayampa Operating Voltage	Reactive Power Participation By	Stability Results	Transient Voltage Dip
530 kV	PVNG=+1079 MVAR HAA=-495 MVAR NET=+584 MVAR	Very Stable No Limit	Palo Verde 500 kV : 8.0% Devers 230 kV: 9.0%
525 kV (Sensitivity)	PVNG=+822 MVAR HAA=-238 MVAR NET=+584 MVAR	Very Stable No Limit	Palo Verde 500 kV : 8.0% Devers 230 kV: 10.0%

(i) The Palo Verde/Hassayampa Switchyard Operated at 530 kV

(See Table 3 for detailed results)

(a) Operating Limits

The generation limit is 9,595 MW for this critical outage. The limiting condition was restricted by a net reactive bucking of 370 MVARs as measured at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. A generation curtailment of 384 MW is required if the net reactive power being bucked at the Palo Verde/Hassayampa, is up to a maximum of 800 MVARs. The summary results are shown in Exhibit 5 below:

Exhibit 5: Critical N-1 Stability Results For 530 kV Operating Voltage

Palo Verde/ Hassayampa Var Restriction	Reactive Power Participation By	Stability Results	Transient Voltage Dip
Knee Point=-370MVARs	PVNG=+130 MVAR HAA=-500 MVAR	Stability Limit No Generation Curtailment	Palo Verde 500 kV: 21.0% Devers 230 kV : 25.0%
Maximum= -800 VARs	PVNG=-365 MVAR HAA=-435 MVAR	Stability Limit Reduced 384 MW HAA Generation	Palo Verde 500 kV: 21.0% Devers 230 kV : 25.0%

(b) Stability Impact by the Gila River Units versus the Hassayampa Units

The previous 2003 Spring Operating Study indicated that the Gila River generating units had a significant stability impact on the PVTS stability limits as to compare with those units directly connected to the Hassayampa Switchyard. That impact was based on a SLG fault with less generation and without the new Palo Verde-Rudd 500 kV line. The 2003 Summer Operating Study showed significant different stability limiting conditions. Therefore, it is necessary to reevaluate the stability impact because of the operating condition changes. The current study showed that the removal of a Gila River unit would yield a slightly worse voltage dip at the Devers 230 kV bus as compared to those units directly connected to the Hassayampa Switchyard. However, this should not affect the Palo Verde plant stability. The results are shown in Exhibit 6 below:

Exhibit 6: Stability Impact of the Gila River Generating Units

Hassayampa Units Versus Gila River Units	Reactive Power Participation By	Stability Results	Transient Voltage Dip
Reduced Harquahala Generation 384 MW	PVNG=-365 MVAR HAA=-435 MVAR	Stability Limit	Palo Verde 500 kV: 21.0% Devers 230 kV: 25.0%
Reduced Gila River Generation 384 MW	PVNG=-298 MVAR HAA=-502 MVAR	Stability Limit	Palo Verde 500 kV: 21.5% Devers 230 kV: 26.0%

(b) Stability Impact by the Gila River Units versus the Hassayampa Units

The current study showed that the the removal of a Gila River unit would yield a slightly worse voltage dip at the Devers 230 kV bus. However, this should not affect the Palo Verde plant stability. The results are shown in Exhibit 9.

Exhibit 9: Stability Impact of the Gila River Generating Units

Hassayampa Units Versus Gila River Units	Reactive Power Participation By	Stability Results	Transient Voltage Dip
Reduced Harquahala Generation 520 MW	PVNG=-636 MVAR HAA=-164 MVAR	Stability Limit	Palo Verde 500 kV: 20.0% Devers 230 kV: 24.0%
Reduced Gila River Generation 520 MW	PVNG=-559 MVAR HAA=-242 MVAR	Stability Limit	Palo Verde 500 kV: 21.5% Devers 230 kV: 26.0%

(c) Sensitivity of the Reactive Power Control/Var Participation

Two different assumptions of reactive power participation by the PVNGS units and the individual Hassayampa generators to control the Palo Verde/Hassayampa Switchyards voltage were also evaluated for the three-phase Palo Verde fault with a trip of the Hassayampa-North Gila line. The results as tabulated below in Exhibit 10 indicated that the difference in reactive power participation have no significant impact on this critical disturbance under the limiting conditions studied.

Exhibit 10: Stability of Reactive Power Participation

Reactive Power Control Techniques	Reactive Power Participation By	Stability Results	Transient Voltage Dip
(1) PVNG Units Solely Control	PVNG=-636 MVAR HAA=-164 MVAR NET=-800 MVAR	Stability Limit Reduced 520 MW HAA Generation	Palo Verde 500 kV: 20.0% Devers 230kV: 24.0%
(2) Both PVNG & HAA Joint Control (Sensitivity)	PVNG=-837 MVAR HAA=+37 MVAR NET=-800 MVAR	Stability Limit Reduced 520 MW HAA Generation	Palo Verde 500 kV: 20.5% Devers 230 kV: 24.0%

(iii) The Palo Verde/Hassayampa Switchyard Operated at 535 kV
(See Table 5 for detailed results)

(a) Operating Limits

The assumption for operating the Palo Verde/Hassayampa at 535 kV was also evaluated. The generation limit is 9,595 MW for this critical outage. The limiting condition was restricted by a net reactive bucking of 500 MVARs as measured at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. A generation

including a three-phase Palo Verde fault with a trip of the Hassayampa-North Gila 500 kV line. It should be pointed out that this transient voltage dip problem is not immediately adjacent to the Palo Verde/Hassayampa network hub and is not critical to the Palo Verde plant stability. Therefore, adding a margin to the determined values to obtain conservative results will not be necessary.

(C) The Updated First Safety Analysis Report (UFSAR):
(See Table 6 for detailed results.)

Updating the First Safety Analysis Report (FSAR) due to the PVTs configuration change is required in order to respond to the mandate of the Nuclear Regulatory Commission (NRC). According to the criteria, it is necessary to add a 7% generation margin to the Palo Verde nuclear units to evaluate the PVTs stability performance. There are certain N-1 contingencies that need to be evaluated based on the maximum generation output of 9,865 MW (adding a 7% generation to the PV units). These N-1 contingencies are listed below:

1. Loss of the most significant transmission line.
2. Loss of the largest single load in WECC (Edmonton pump load=840 MW).
3. Loss of the largest generating unit in WECC (Palo Verde unit=1,442 MW).

The stability results are summarized in Table 5 of the Appendix B. The significant of the results are highlighted as follows:

1. The most severe N-1 contingency was a three-phase fault on the Hassayampa 500 kV bus and loss of the Hassayampa-North Gila 500 kV line. However, the results showed a stable case and transient voltage dips were within the acceptable limits. The lowest voltage dips were at 20% and 20%, respectively at the Palo Verde and Devers 230 kV buses.
2. The next critical N-1 contingency was a three-phase fault on the Palo Verde 500 kV bus and loss of one Palo Verde-Westwing 500 kV line. This case resulted in a stable case. The lowest voltage dips were at 21% and 12%, respectively at the Palo Verde and Devers 230 kV buses.
3. All other N-1 contingencies showed stable and well damped and transient voltage dips were within the WECC voltage dip criteria

(D) Evaluating the Maximum Credible Contingency Outages
(See Table 7 for detailed results.)

Certain multiple contingency outages were evaluated to address the WECC reliability concern in particular with respect to the Southwest Regional Operating Limits Study (OTC) scope and certification. The evaluations included the following:

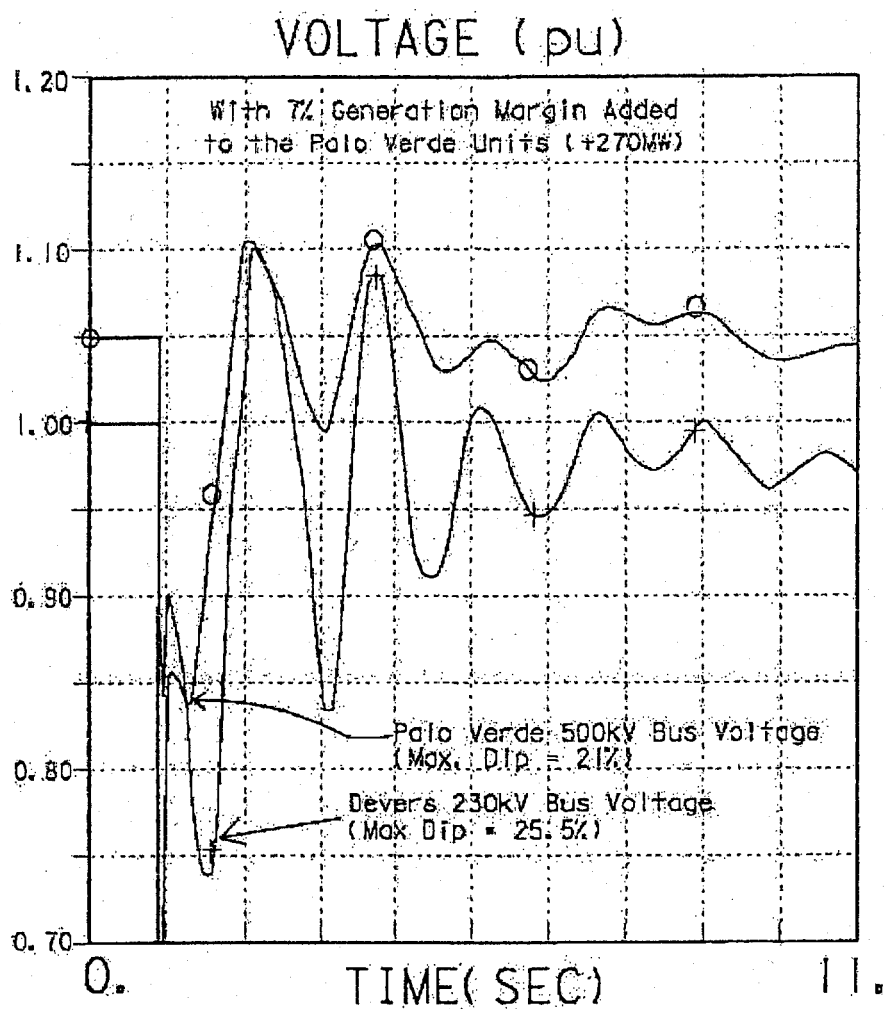
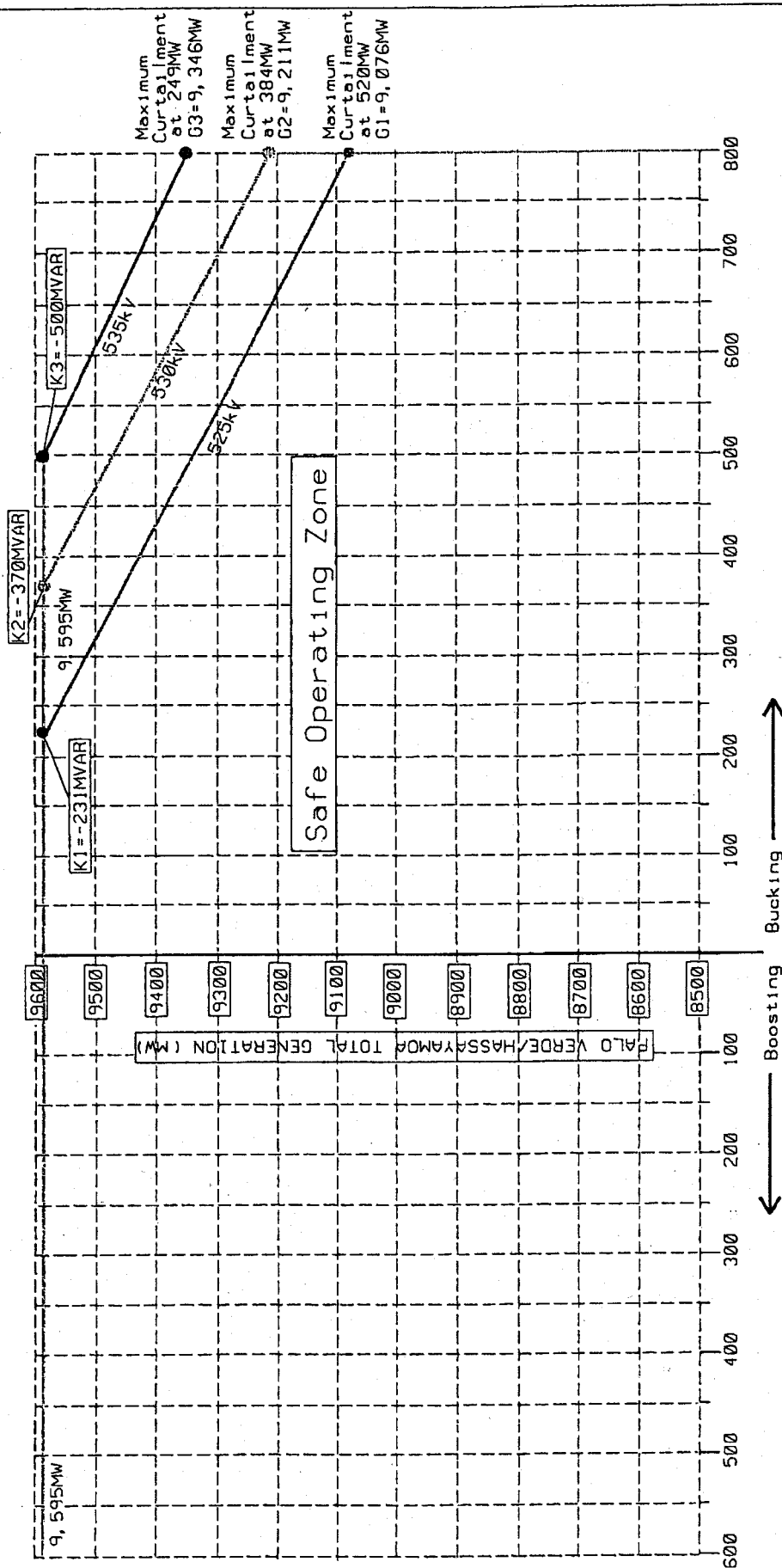


Figure B: Bus Voltage Swing for 3 Phase Fault on
the Hassayampa - North Gila 500kV Line

FIGURE 1 2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMITS

GENERATION CURTAILMENTS WITHOUT REMEDIAL ACTION SCHEME
WITH A TOTAL OF 9,595MW OF GENERATION UNDER ALL
LINES INCLUDING PV-RUDD IN-SERVICE CONDITIONS

(A 3-PHASE PV 500kV FAULT WITH HASSAYAMPA - N. GILA LINE OUTAGE)



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE 500kV BUS VOLTAGES OPERATED BETWEEN 525kV AND 535kV RANGE

TABLE 2

TRANSIENT STABILITY SUMMARY OF RESULTS

SINGLE-LINE-TO-GROUND PALO VERDE FAULT WITH TWO PALO VERDE-WESTWING 500 KV LINES OUTAGE
2003 SUMMER PALO VERDE OPERATING LIMITS WITH ALL LINES INCLUDING PALO VERDE-RUDD 500 KV LINE IN SERVICE

WITH THREE PALO VERDE UNITS AND POSSIBLE MAXIMUM HASSAYAMPA GENERATION ON-LINE (TOTAL NET GEN=9,595MW)
(PALO VERDE=3861MW, ARLINGTON =993MW, REDHAWK =915MW, MESQUITE=998MW, HARQUAHALA =1148MW, GILA RIVER=2080MW)

PRE-DISTURBANCE POWER FLOW CONDITIONS														POWER FLOW RESULTS			
CASE NO.	CASE DESCRIPTION	PVNG GEN	NEW GEN	PVIHAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	KYR500	DV230	COMMENTS				
PVIHAA OPERATING VOLTAGE @ 530 KV																	
PF-03-SUM-01A (PVNG CONTROL)	PVIHAA NORMAL BOOSTING (+584MVAR) (PVNG=-+1079MVAR & HAA=-485MVAR)	3861	5734	9595	8399	2701	9100	5615	13403	1.06	1.064	1.00	THERMAL LIMIT (N-0)				
PF-03-SUM-01B (PVNG CONTROL)	PVIHAA MAXIMUM BUCKING (-801MVAR) (PVNG=-298MVAR & HAA=-503MVAR)	3861	5734	9595	8412	2689	9102	5625	13403	1.06	1.077	1.00	THERMAL LIMIT (N-0)				
PF-03-SUM-01AR (PVIHAA CONTROL)	PVIHAA NORMAL BOOSTING (+593MVAR) (PVNG=-+545MVAR & HAA=-+48MVAR)	3861	5734	9595	8399	2701	9100	5615	13403	1.06	1.064	1.00	THERMAL LIMIT (N-0)				
PF-03-SUM-01BR (PVIHAA CONTROL)	PVIHAA MAXIMUM BUCKING (-802MVAR) (PVNG=-430MVAR & HAA=-+28MVAR)	3861	5734	9595	8413	2688	9101	5625	13403	1.06	1.076	1.00	THERMAL LIMIT (N-0)				
PVIHAA OPERATING VOLTAGE @ 525 KV																	
PF-03-SUM-01C (PVNG CONTROL)	PVIHAA NORMAL BOOSTING (+584MVAR) (PVNG=-+822MVAR & HAA=-238MVAR)	3861	5734	9595	8412	2686	9098	5611	13401	1.05	1.056	1.00	THERMAL LIMIT (N-0)				
PF-03-SUM-01D (PVNG CONTROL)	PVIHAA MAXIMUM BUCKING (-802MVAR) (PVNG=-560MVAR & HAA=-242MVAR)	3861	5734	9595	8419	2681	9100	5630	13412	1.05	1.072	1.00	THERMAL LIMIT (N-0)				
TRANSIENT STABILITY CONDITIONS																	
CASE NO.	N-2 CONTINGENCY	PVIHAA 500KV NET VAR	PV TO HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS								
														PV500	KYR500	DV230	COMMENTS
PVIHAA OPERATING VOLTAGE @ 530 KV																	
ST-03-SUM-01A (PVNG CONTROL)	SLG PV FLT,TWO PV-WWVG OUT	584	894	NO	NONE	0.98	0.94	0.91	8.0%	12.4%	9.0%	0.91	STABLE VOLTAGE DIP WITHIN LIMIT				
ST-03-SUM-01B (PVNG CONTROL)	SLG PV FLT,TWO PV-WWVG OUT	-801	647	NO	NONE	0.88	0.89	0.86	18.0%	18.7%	14.0%	0.86	STABLE VOLTAGE DIP WITHIN LIMIT				
ST-03-SUM-01AR (PVIHAA CONTROL)	SLG PV FLT,TWO PV-WWVG OUT	593	158	NO	NONE	0.98	0.94	0.90	8.0%	12.4%	10.0%	0.90	STABLE VOLTAGE DIP WITHIN LIMIT				
ST-03-SUM-01BR (PVIHAA CONTROL)	SLG PV FLT,TWO PV-WWVG OUT	-802	126	NO	NONE	0.88	0.89	0.85	18.0%	18.6%	15.0%	0.85	STABLE VOLTAGE DIP WITHIN LIMIT				
PVIHAA OPERATING VOLTAGE @ 525 KV																	
ST-03-SUM-01C (PVNG CONTROL)	SLG PV FLT,TWO PV-WWVG OUT	584	443	NO	NONE	0.96	0.93	0.90	9.0%	12.6%	10.0%	0.90	STABLE VOLTAGE DIP WITHIN LIMIT				
ST-03-SUM-01D (PVNG CONTROL)	SLG PV FLT,TWO PV-WWVG OUT	-802	284	NO	NONE	0.86	0.87	0.85	19.0%	20.2%	15.0%	0.85	STABLE VOLTAGE DIP WITHIN LIMIT				

TABLE 3 (CONTINUED)

TRANSIENT STABILITY SUMMARY OF RESULTS

THREE-PHASE PALO VERDE FAULT WITH NORMAL SINGLE LINE OUTAGE CONDITIONS
2003 SUMMER PALO VERDE OPERATING VOLTAGE AT 530 KV WITH ALL LINES INCLUDING PALO VERDE-RUDD 500 KV LINE IN SERVICE

WITH THREE PALO VERDE UNITS AND POSSIBLE MAXIMUM HASSAYAMPA GENERATION ON-LINE (TOTAL NET GEN=9,595MW)

(PALO VERDE=381MW, ARLINGTON=693MW, REDHAWK=516MW, MESQUITE=988MW, HARQUAHALA=1148MW, GILA RIVER=2080MW)

STABILITY IMPACT BY HAA UNITS VS GILA RIVER UNITS

REDUCED HARQUAHALA GENERATION BY 384 MW

PRE-DISTURBANCE	CASE DESCRIPTION	PVING GEN	NEW GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	DV500	DV230	COMMENTS
PF-03-SUM-01BF1 (REDUCED HAA GEN BY 384 MW)	PV/HAA MAXIMUM BUCKING (-800MWARS) (PVING=-350MWAR & HAA=-430MWAR)	3861	5350	9211	5988	2747	8735	5889	13408	1.06	1.024	1.01	THERMAL LIMIT (N-0) ONLY HAA-NG 500 KV LINE
STABILITY CASE BY 384 MW													
ST-03SUM01BF1-A* (REDUCED HAA GEN BY 384 MW)	N-1 CONTINGENCY 3PH HAA FLT, HAA-NG 500KV LINE OUT	-800	655	NO	GEN TRIP	GEN				PV500	DV500	DV230	COMMENTS
										0.85	0.69	0.76	STABILITY LIMIT 25.0% VOLTAGE DIPS AT THE LIMIT
										21.0%	33.4%		
REDUCED GILA RIVER GENERATION BY 384 MW													
PF-03-SUM-01BF2 (REDUCED GILA RV GEN BY 384 MW)	PV/HAA MAXIMUM BUCKING (-800MWARS) (PVING=-288MWAR & HAA=-502MWAR)	3861	5350	9211	6011	2744	8761	5676	13388	1.06	1.024	1.01	THERMAL LIMIT (N-0) ONLY HAA-NG 500 KV LINE
STABILITY CASE BY 384 MW													
ST-03SUM01BF2-A* (REDUCED GILA RV GEN BY 384 MW)	N-1 CONTINGENCY 3PH HAA FLT, HAA-NG 500KV LINE OUT	-800	680	NO	GEN TRIP	GEN				PV500	DV500	DV230	COMMENTS
										0.845	0.69	0.76	STABILITY LIMIT 26.0% VOLTAGE DIPS AT THE LIMIT
										21.5%	33.4%		

SENSITIVITY OF REACTIVE POWER PARTICIPATION

PVING GEN	NEW GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	DV500	DV230	COMMENTS				
PF-03-SUM-01EF (PVING CONTROL)	PV/HAA VAR RESTRICTION (-370MVAR) (PVNG=-130MVAR & HAA=-500MVAR)	3861	5734	9595	6361	2742	9102	5634	13337	1.06	1.024	1.01	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR		
PF-03-SUM-01BF1 (PVING CONTROL)	PV/HAA MAXIMUM BUCKING (-800MWARS) (PVNG=-285MVAR & HAA=-504MVAR)	3861	5350	9211	5988	2747	8735	5689	13408	1.06	1.024	1.01	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR		
STABILITY CASE ST-03SUM01EF-A* (PVING CONTROL)	N-1 CONTINGENCY 3PH HAA FLT, HAA-NG 500KV LINE OUT	NET VAR -370	PV-HAA VAR 766	RAS SCHEME NO	GEN TRIP NONE	SPECIFIC UNITS						PV500	DV500	DV230	COMMENTS
										0.85	0.70	0.76	STABILITY LIMIT 25.0% VOLTAGE DIPS AT THE LIMIT		
										21.0%	32.4%				
ST-03SUM01BF1-A* (PVING CONTROL)	3PH-HAA FLT, HAA-NG 500KV LINE OUT	-800	855	NO	NONE					0.85	0.69	0.76	STABILITY LIMIT 25.0% VOLTAGE DIPS AT THE LIMIT		
										21.0%	33.4%				
PVING/HAA INTERCONNECTORS BOTH CONTROL VOLTAGE															
PF-03-SUM-01EF (PV/HAA CONTROL)	PV/HAA VAR RESTRICTION (-389MVAR) (PVNG=-446MVAR & HAA=-771MVAR)	3861	5734	9595	6361	2742	9103	5634	13337	1.06	1.024	1.01	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR		
PF-03-SUM-01BF1 (PV/HAA CONTROL)	PV/HAA MAXIMUM BUCKING (-800MWARS) (PVNG=-277MVAR & HAA=-504MVAR)	3861	5350	9211	5988	2747	8735	5689	13408	1.06	1.024	1.01	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR		
STABILITY CASE ST-03SUM01EF-A* (PV/HAA CONTROL)	N-1 CONTINGENCY 3PH HAA FLT, HAA-NG 500KV LINE OUT	NET VAR -389	PV-HAA VAR 205	RAS SCHEME NO	GEN TRIP NONE	SPECIFIC UNITS						PV500	DV500	DV230	COMMENTS
										0.85	0.70	0.76	STABILITY LIMIT 25.0% VOLTAGE DIPS AT THE LIMIT		
										21.0%	32.4%				
ST-03SUM01BF1-A* (PV/HAA CONTROL)	3PH HAA FLT, HAA-NG 500KV LINE OUT	-800	153	NO	NONE					0.845	0.69	0.76	STABILITY LIMIT 25.0% VOLTAGE DIPS AT THE LIMIT		
										21.5%	33.4%				

* NOTE: THESE CASES WERE REPRESENTED WITH THE STABILITY

TABLE 4 (CONTINUED)

TRANSIENT STABILITY SUMMARY OF RESULTS

THREE-PHASE PALO VERDE FAULT WITH NORMAL SINGL LINE OUTAGE CONDITIONS
2003 SUMMER PALO VERDE OPERATING VOLTAGE AT 525 KV WITH ALL LINES INCLUDING PALO VERDE-RUDD 500 KV LINE IN SERVICE

WITH THREE PALO VERDE UNITS AND POSSIBLE MAXIMUM HASSAYAMPA GENERATION ON-LINE (TOTAL NET GEN=9,595MW)
(PALO VERDE=3861MW, ARLINGTON=5831MW, REDHAWK=815MW, MESQUITE=499MW, HARGRAHA=1148MW, GILA RIVER=2080MW)

SENSITIVITY OF REACTIVE POWER PARTICIPATION

PVNG CONTROL VOLTAGE ONLY													
PRE-DISTURBANCE	CASE DESCRIPTION	PVNG GEN	NEW GEN	PVHAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	DV500	DV230	COMMENTS
PF-03-SUM-0101F (PVNG CONTROL)	PVHAA VAR RESTRICTION (-231MVAR) (PVNG=+7MVAR & HAA=-238MVAR)	3861	5734	9595	6357	2745	9102	5640	13342	1.05	1.018	1.00	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR
PF-03-SUM-0102F (PVNG CONTROL)	PVHAA MAXIMUM BUCKING (-800MVAR) (PVNG=-635MVAR & HAA=-164MVAR)	3861	5214	9075	5860	2743	8603	5703	13430	1.05	1.019	1.00	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR
STABILITY CASE	N-1 CONTINGENCY	PVHAA NET VAR	PVHAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			COMMENTS				
ST-03-SUM-0101F-A* (PVNG CONTROL)	3PH HAA FLT; HAA-NG 500KV LINE OUT	-231	434	NO	NONE				0.845 20.5%	0.688 33.0%	0.785 24.5%	0.750 24.5%	STABILITY LIMIT VOLTAGE DIPS AT THE LIMIT
ST-03-SUM-0102F-A* (PVNG CONTROL)	3PH HAA FLT; HAA-NG 500KV LINE OUT	-800	272	NO	NONE				0.85 20.0%	0.70 31.9%	0.76 24.0%	0.76 24.0%	STABILITY LIMIT VOLTAGE DIPS AT THE LIMIT

PVNG/HAA INTERCONNECTORS BOTH CONTROL VOLTAGE

PRE-DISTURBANCE	CASE DESCRIPTION	PVNG GEN	NEW GEN	PVHAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	DV500	DV230	COMMENTS
PF-03-SUM-0101R (PVHAA CONTROL)	PVHAA VAR RESTRICTION (-232MVAR) (PVNG=-490MVAR & HAA=-258MVAR)	3861	5734	9595	6357	2745	9102	5642	13344	1.05	1.018	1.00	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR
PF-03-SUM-0102R (PVHAA CONTROL)	PVHAA MAXIMUM BUCKING (-800MVAR) (PVNG=-437MVAR & HAA=-37MVAR)	3861	5214	9075	5859	2744	8603	5703	13429	1.05	1.019	1.00	THERMAL LIMITS (N-0) BOTH HAA-NG & JOJOBA-KYR
STABILITY CASE	N-1 CONTINGENCY	PVHAA NET VAR	PVHAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			COMMENTS				
ST-03-SUM-0101R-A* (PVHAA CONTROL)	3PH HAA FLT; HAA-NG 500KV LINE OUT	-232	-53	NO	NONE				0.85 21.0%	0.686 33.0%	0.750 25.0%	0.750 25.0%	STABILITY LIMIT VOLTAGE DIPS AT THE LIMIT
ST-03-SUM-0102R-A* (PVHAA CONTROL)	3PH HAA FLT; HAA-NG 500KV LINE OUT	-800	74	NO	NONE				0.850 20.0%	0.70 31.9%	0.76 24.0%	0.76 24.0%	STABILITY LIMIT VOLTAGE DIPS AT THE LIMIT

* NOTE: THESE CASES WERE REPRESENTED WITH THE STABILITY

TABLE 6

NERC FIRST SAFETY ANALYSIS REPORT (FSAR)

2003 SUMMER PALO VERDE OPERATING LIMITS WITH 9,865 MW OF NET GENERATION INJECTED INTO THE PALO VERDE SYSTEM

ADDED 7% PALO VERDE GENERATION MARGIN WITH PALO VERDE BOOSTING 606 MW⁵
 (PV=4161MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=998MW, HARQUAHALA=1148MW AND GILA RIVER=2080MW)

PRE-DISTURBANCE CONDITIONS	POWER FLOW CASE DESCRIPTION	PVNG GEN	PV GEN MARGIN	NEW GEN	PVIHAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS				
											PV500	DV500	DV230	COMMENTS	
PF-SUM01AG ADDED 7% PV GEN MAR	PVIHAA 500 KV BOOSTING (+606MW/AR) (PVNG=+590MW/AR&HAA=300MW/AR)	4131	7%	5714	9865	6619	2773	9392	5633	13525	1.06	1.025	1.01	ADDED 7% PV GEN MARGIN	
CASE NO.	TRANSIENT STABILITY CASE DESCRIPTION	PV500KV NET VAR	HAA500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS			COMMENTS		
							PV500	KYR500	DV230	PV500	KYR500	DV230			
N-1 OUTAGES RT-SUM01AG-A	3PH PV FLT, HAA-H-GILA OUT	996	-390	606	NO	NONE		PV500 0.86 20.0%	DV500 0.75 27.5%	DV230 0.510 20.0%	PV500 0.87 19.0%	DV500 0.87 NSP	DV230 NSP	STABLE, V DIP WITHIN THE LIMIT	
RT-SUM01AG-B	3PH PV FLT, PV-DEVERS OUT	996	-390	606	NO	NONE		PV500 0.87 19.0%	DV500 0.87 NSP	DV230 NSP	PV500 0.87 19.0%	DV500 0.87 NSP	DV230 NSP	STABLE, V DIP WITHIN THE LIMIT	
RT-SUM01AG-C	3PH HAA FLT, HAA-JOJOBA OUT	996	-390	606	NO	NONE		PV500 0.87 19.0%	DV500 0.88 14.5%	DV230 0.91 10.0%	PV500 0.87 19.0%	DV500 0.88 14.5%	DV230 0.91 10.0%	STABLE, V DIP WITHIN THE LIMIT	
RT-SUM01AG-D	3PH JOJOBA FLT, JOJOBA-KYR OUT	996	-390	606	NO	NONE		PV500 0.94 12.0%	DV500 0.82 10.5%	DV230 0.94 7.0%	PV500 0.94 12.0%	DV500 0.82 10.5%	DV230 0.94 7.0%	STABLE, V DIP WITHIN THE LIMIT	
RT-SUM01AG-E	3PH PV FLT, ONE PV-WESTWING OUT	996	-390	606	NO	NONE		PV500 0.85 21.0%	DV500 0.85 17.5%	DV230 0.89 12.0%	PV500 0.85 21.0%	DV500 0.85 17.5%	DV230 0.89 12.0%	STABLE, V DIP WITHIN THE LIMIT	
RT-SUM01AG-F	LOSS OF A LARGEST LOAD IN WECC (EDMONTON PUMPING LOAD=640MW)	996	-390	606	NO	NONE		NSP	NSP	NSP	NSP	NSP	NSP	VERY STABLE	
RT-SUM01AG-G	LOSS OF ONE PALO VERDE UNIT (PV UNIT3 GROSS GEN=1442MW)	996	-390	606	NO	NONE		NSP	NSP	NSP	NSP	NSP	NSP	NSP	VERY STABLE

* NSP- NO SIGNIFICANT PROBLEM.

TABLE 8

THE EFFECT OF ADDING 7% GENERATION MARGIN ON THE PALO VERDE PLANT STABILITY

2003 SUMMER PALO VERDE OPERATING LIMITS WITH 9,865 MW OF NET GENERATION INJECTED INTO THE PALO VERDE SYSTEM

ADDED 7% PALO VERDE GENERATION MARGIN WITH PALO VERDE SWITCHYARD VOLTAGE AT 525 KV
(PV=4111MW, ARLINGTON=583MW, REDHAWK=815MW, MESQUITE=888MW, HARQUAHALA=1148MW AND GILA RIVER=2080MW)

(A) PV/HAA NET VAT AT BOOSTING OF 238 MVARs

PRE-DISTURBANCE CONDITIONS	POWER FLOW CASE DESCRIPTION	PVNG GEN	PV GEN MARGIN	NEW GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS			
											PV500	COMMENTS		
PF-SUM8103FM ADDED 7% PV GEN MAR	PV/HAA 500 KV NET VAR (+238MVAR) (PVNG=474MVAR/HAA=238MVAR)	4131	7%	3724	9865	5602	2762	9364	5646	13340	1.05	ADDED 7% PV GEN MARGIN		
CASE NO.	TRANSIENT STABILITY CASE DESCRIPTION	PV/HAA NETVAR	HAA500KV NETVAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS		TRANSIENT STABILITY RESULTS					
							PV500	KYR500	DV230	COMMENTS				
MULTIPLE CREDIBLE OUTAGES ST-SUM8103FM-A 3 PH FAULT ON HASSAYANPA 500 KV WITH HASSAYANPA-N GILA LINE OUT		238	-238	522	NO	NONE					PV500 0.84 21.0%	KYR500 0.93 9.3%	DV230 0.745 25.5%	STABLE, WELL DAMPED DEVIATES V/DIP AT THE LIMIT

(B) PV/HAA NET VAT AT BUCKING 231 MVARs

PRE-DISTURBANCE CONDITIONS	POWER FLOW CASE DESCRIPTION	PVNG GEN	PV GEN MARGIN	NEW GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS		
											PV500	DV230	COMMENTS
PF-SUM8104FM ADDED 7% PV GEN MAR	PVHAA 500 KV NET VAR (-231MVAR) (PVNG=491MVAR&HAA=240MVAR)	4131	7%	5734	9865	6615	2748	9363	5644	13279	1.05	1.05	ADDED 7% PV GEN MARGIN
CASE NO.	TRANSIENT STABILITY CASE DESCRIPTION	PVHAA NET VAR	HAA500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS			
							PV500	KYR500	DV230	PV500	KYR500	DV230	COMMENTS
MULTIPLE CREDIBLE OUTAGES 3 PH FAULT ON HASSAYANPA 500 KV WITH HASSAYANPA-N GILA LINE OUT		-231	-240	370	NO	NONE							

* NSP: NO SIGNIFICANT PROBLEM.

APPENDIX “B”

**2003 Summer Palo Verde Transmission System
N-1 Initially Out of Service
Supplementary Operating Study Report**

**By
James C. Hsu
Salt River Project**

June 4, 2003

Version (A)

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**2003 SUMMER PALO VERDE TRANSMISSION SYSTEM
N-1 INITIALY OUT OF SERVICE
SUPPLEMENTARY OPERATING STUDY REPORT**

I. INTRODUCTION

This report documents a supplementary study to Attachment C of the Interchange Scheduling and Congestion Management Procedure Revision 7 to determine the 2003 summer plant operating limits for several new categories. Those categories included (N-1) major transmission facilities initially out of service in the Palo Verde Transmission System (PVTs). For single line initially out of service categories, the critical outage is the double line Palo Verde-Westwing outage initiated by a single-line-to-ground fault except one Palo Verde-Westwing line out. With one Palo Verde-Westwing 500 kV line out, the critical outage is loss of the remaining Westwing line but initiated by a three-phase fault. A 7% generation margin was added to the Palo Verde units for a three-phase Palo Verde fault with a single line outage. The single-line-to-ground fault only applies to a double line outage and does not require an addition of a 7% generation margin to the Palo Verde units. For the series capacitor bank or the transformer initial out of service categories, the critical outage is a three-phase Palo Verde fault with the outage of the Hassayampa-N.Gila line with a resultant voltage dip at the Devers 230 kV bus. The fault and the lines were cleared in four cycles in all cases. Additional N-1 analysis will be conducted as requested by Operations. The initially out of service categories included in this supplement are the following facilities:

Lines Initially Out of Service:

1. Palo Verde – Rudd 500 kV line
2. Palo Verde – Devers 500 kV line
3. Hassayampa – North Gila 500 kV line
4. One Palo Verde- Westwing 500 kV line
5. Hassayampa-Jojoba 500 kV line
6. Jojoba-Kyrene 500 kV line

Series Capacitors Out of Service in the following lines:

7. Palo Verde – Devers 500 kV line one segment out on the Arizona side
8. Palo Verde – Devers 500 kV line one segment out on the California side
9. Hassayampa – North Gila 500 kV line
10. North Gila-Imperial Valley 500 kV line
11. Imperial Valley-Miguel 500 kV line

Transformer Initially Out of Service:

12. Gila River 500/230 kV Transformer

Other Significant California Lines Initially Out of Service:

13. North Gila – Imperial Valley 500 kV line
14. Imperial Valley – Miguel 500 kV line
15. North Gila-Imperial Valley and Hassayampa-N.Gila Series Capacitors
16. Devers-Valley (SCE) 500 kV line

II. RESULTS/CONCLUSIONS

Lines Initially Out of Service (N-1):

1. Palo Verde-Rudd 500 kV Line

(See Operating Nomogram Figure IOS-1 and Table 1 for detailed study results)

The maximum thermal limit for the PVTs with the Palo Verde-Rudd line out of service was approximately 8,095 MW. The limiting elements were the continuous ratings at both the Hassayampa-N. Gila and Jojoba-Kyrene lines under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), one Mesquite unit (499MW), two Harquahala units (667MW) and three Gila River units (1,560MW).

With this net generation of 8,095 MW, the stability was restricted to a net reactive power boosting net of 901 MVARs (Point K1 of Figure IOS-1) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 1,079 MW generation (Point G1 of Figure IOS-1) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 7,810 MW with the removal of one Harquahala unit (285MW). This 7,810 MW generation was limited by a net reactive boosting of 106 MVARs (Point K2 of Figure IOS-1, as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 561 MW generation (Point G2 of Figure IOS-1) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 7,500 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Since the critical fault occurs at the Palo Verde/Hassayampa Common Bus, Gila River units' impact relative to Hassayampa units is 0.5 to 1 ratio because the Gila River units are electrically farther away.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-1.

2. Palo Verde-Devers 500 kV Line

(See Operating Nomogram Figure IOS-2 and Table 2 for detailed study results)

The maximum thermal limit for the PVTs with the Palo Verde-Devers line out of service was approximately 8,192 MW. The limiting elements were the continuous ratings at both the Hassayampa-N. Gila and Jojoba-Kyrene lines under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), one Mesquite unit (499MW), two Harquahala units (764MW) and three Gila River units (1,560MW).

With this net generation of 8,095 MW, the stability was restricted to a net reactive power bucking of 421 MVARs (Point K1 of Figure IOS-2) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 300 MW generation (Point G1 of Figure IOS-2) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 8,063 MW with the removal of one Harquahala CT unit (129MW). This 8,063 MW generation was limited by a net reactive bucking of 683 MVARs (Point K2 of Figure IOS-2, as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 83 MW generation (Point G2 of Figure IOS-2) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 8,001 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Since the critical fault occurs at the Palo Verde/Hassayampa Common Bus, Gila River units' impact relative to Hassayampa units is 0.5 to 1 ratio because the Gila River units are electrically farther away.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-2.

3. Hassayampa-North Gila 500 kV Line

(See Operating Nomogram Figure IOS-3 and Table 3 for detailed study results)

The maximum thermal limit for the PVTs with the Hassayampa-North Gila line out of service was approximately 8,591 MW. The limiting elements were the continuous ratings at both the Palo Verde-Devers and Jojoba-Kyrene lines under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), one Mesquite unit (499MW), two Harquahala units (764MW) and four Gila River units (1,959MW).

With this net generation of 8,591 MW, the stability was restricted to a net reactive power boosting of 134 MVARs (Point K1 of Figure IOS-3) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 758MW generation (Point G1 of Figure

IOS-3) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 8,209 MW with the removal of one Harquahala unit (382MW). This 8,209 MW generation was limited by a net reactive bucking of 418 MVARs (Point K2 of Figure IOS-3, as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 250 MW generation (Point G2 of Figure IOS-3) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 8,000 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Since the critical fault occurs at the Palo Verde/Hassayampa Common Bus, Gila River units' impact relative to Hassayampa units is 0.5 to 1 ratio because the Gila River units are electrically farther away.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-3.

4. One Palo Verde-Westwing 500 kV Line

(See Operating Nomogram Figure IOS-4 and Table 4 for detailed study results)

The maximum thermal limit for the PVTs with the Hassayampa-North Gila line out of service was approximately 8,615 MW. The limiting elements were the continuous ratings at both the Hassayampa-North Gila and Jojoba-Kyrene lines under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), one Mesquite unit (499MW), two Harquahala units (667W) and four Gila River units (2,080MW).

For First Safety Analysis Report (FSAR), an additional 7% Palo Verde generation must be added when studying three phase faults. With a net generation of 8,885MW, which included the 7% Palo Verde generation margin (additional 270MW), the stability was restricted to a net reactive power boosting of 613 MVARs (Point K1 of Figure IOS-4) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 2,757MW generation (Point G1 of Figure IOS-4) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 8,600 MW with the removal of one Harquahala unit (285MW). This 8,600 MW generation was limited by a net reactive boosting of 253 MVARs (Point K2 of Figure IOS-4, as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 2,104 MW generation (Point G2 of Figure IOS-4) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 7,250 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Since the critical fault occurs at the Palo Verde/Hassayampa Common Bus, Gila River units' impact relative to Hassayampa units is 0.5 to 1 ratio because the Gila River units are electrically farther away.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-4.

5. Hassayampa-Jojoba 500 kV Line

(See Operating Nomogram Figure IOS-5 and Table 5 for detailed study results)

The maximum thermal limit for the PVTs with the Hassayampa-Jojoba line out of service was approximately 6,932 MW. The limiting element was the continuous rating at the Hassayampa-North Gila line under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), two Mesquite unit (799MW) and two Harquahala units (764W). Noted that the Gila River generation of 2080MW was isolated from the Palo Verde/Hassayampa network hub.

With this net generation of 6,932 MW, the stability limit was restricted to a net reactive power boosting of 631 MVARs (Point K1 of Figure IOS-5) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 1,337MW generation (Point G1 of Figure IOS-5) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 6,550 MW with the removal of one Harquahala unit (382MW). This 6,550 MW generation was limited by a net reactive bucking of 134 MVARs (Point K2 of Figure IOS-5, as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 677 MW generation (Point G2 of Figure IOS-5) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 6,200 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-5.

6. Jojoba-Kyrene 500 kV Line

(See Operating Nomogram Figure IOS-6 and Table 6 for detailed study results)

The maximum thermal limit for the PVTs with the Hassayampa-Jojoba line out of service was approximately 8,021 MW. The limiting elements were the continuous rating at the Hassayampa-North Gila line under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), two Mesquite unit (848MW) and two Harquahala units (764W) and two Gila River units (1,040MW).

With this net generation of 8,021 MW, the stability limit was restricted to a net reactive power boosting of 410 MVARs (Point K1 of Figure IOS-6) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 929MW generation (Point G1 of Figure IOS-6) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 7,639 MW with the removal of one Harquahala unit (382MW). This 7,639 MW generation was limited by a net reactive bucking of 305 MVARs (Point K2 of Figure IOS-6, as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 390 MW generation (Point G2 of Figure IOS-6) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 6,200 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

The loss of the Jojoba-Kyrene line results in Gila River units' impact relative to Hassayampa units of 1 to 1 ratio.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-6.

Series Capacitors Out of Service in the following lines:

7. Palo Verde – Devers 500 kV line One Segment Out on the Arizona Side

(See Operating Nomogram Figure IOS-7 and Table 7 for detailed results)

With one series capacitor bank (on the Arizona side) of the Palo Verde-Devers 500 kV line initially out of service, the thermal capability was reduced from 9,595 MW to 9,465 MW. The thermal limit was at the Hassayampa-North Gila line series capacitor continuous rating. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,465 MW, the stability limit was restricted by reactive power boosting at 115 MVARs (Point K1 of Figure IOS-7) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 530 MW (Point G1 of Figure IOS-7) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

8. Palo Verde – Devers 500 kV line One Segment Out on the California Side
(See Operating Nomogram Figure IOS-8 and Table 8 for detailed results)

With one series capacitor bank (on the California side) of the Palo Verde-Devers 500 kV line initially out of service, the thermal capability was reduced from 9,595 MW to 9,495 MW. The thermal limit was at the Hassayampa-North Gila line series capacitor continuous rating. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,495 MW, the stability limit was restricted by reactive power bucking at 34 MVARs (Point K1 of Figure IOS-8) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 364 MW (Point G1 of Figure IOS-8) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

9. Hassayampa – North Gila 500 kV line
(See Operating Nomogram Figure IOS-9 and Table 9 for detailed results)

With the Hassayampa-North Gila 500 kV series capacitor bank initially out of service, the thermal capability was reduced from 9,595 MW to 9,545 MW. The thermal limit was at the Jojoba-Kyrene continuous rating. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,545 MW, the stability limit was restricted by reactive power bucking at 174 MVARs (Point K1 of Figure IOS-9) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 610 MW (Point G1 of Figure IOS-9) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

10. North Gila-Imperial Valley 500 kV line
(See Operating Nomogram Figure IOS-10 and Table 10 for detailed results)

With the North Gila-Imperial Valley 500 kV series capacitor bank initially out of service, the thermal capability was reduced from 9,595 MW to 9,545 MW. The thermal limit was at the

Jojoba-Kyrene continuous rating. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,545 MW, the stability limit was restricted by reactive power bucking at 182 MVARs (Point K1 of Figure IOS-10) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 334 MW (Point G1 of Figure IOS-10) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

11. Imperial Valley-Miguel 500 kV line

(See Operating Nomogram Figure IOS-11 and Table 11 for detailed results)

With the Imperial Valley-Miguel 500 kV series capacitor bank initially out of service, the thermal capability was reduced from 9,595 MW to 9,545 MW. The thermal limit was at the Jojoba-Kyrene continuous rating. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,545 MW, the stability limit was restricted by reactive power bucking at 196 MVARs (Point K1 of Figure IOS-11) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 334 MW (Point G1 of Figure IOS-11) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

Transformer Initially Out of Service:

12. Gila River 500/230 kV Transformer

(See Operating Nomogram Figure IOS-12 and Table 12 for detailed results)

With the Gila River 500/230 kV transformer initially out of service, the thermal capability was reduced from 9,595 MW to 9,225MW. The thermal limits were at the series capacitor rating of the Hassayampa- North Gila line and the breakers and disconnect switches ratings of the Hassayampa-Jojoba-Kyrene line. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), two Mesquite unit (998MW) and three Harquahala units (1,148W) and four Gila River units (1,710MW).

With this net generation of 9,225 MW, the stability limit was restricted to reactive power boosting of 240 MVARs (Point K1 of Figure IOS-12) at the Palo Verde/Hassayampa 500kV Common Bus. The further generation curtailment of a 534 MW generation (Point G1 of Figure IOS-12) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

Other Significant California Lines Initially Out of Service:

13. North Gila- Imperial Valley 500 kV Line

(See Operating Nomogram Figure IOS-13 and Table 13 for detailed results)

With the North Gila-Imperial Valley 500 kV line initially out of service, the thermal capability was reduced from 9,595 MW to 8,966MW. The thermal limits were at the series capacitor rating of the Palo Verde- Devers line and the breakers and disconnect switches ratings of the Hassayampa-Jojoba-Kyrene line under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), one Mesquite unit (499MW), two Harquahala units (1,018MW) and three Gila River units (2,080MW).

For the stability limit, the critical fault was a single-line-to-ground fault at Palo Verde with two Palo Verde-Westwing lines outage. With this net generation of 8,966 MW, the stability was restricted to a net reactive power boosting net of 343 MVARs (Point K1 of Figure IOS-13) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 862 MW generation (Point G1 of Figure IOS-13) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 8,712 MW with the removal of one Harquahala unit (254MW). This 8,712 MW generation was limited by a net reactive bucking of 103 MVARs (Point K2 of Figure IOS-13), as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 540 MW generation (Point G2 of Figure IOS-13) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 8,350 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-13.

14. Imperial Valley-Miguel 500 kV line

(See Operating Nomogram Figure IOS-14 and Table 14 for detailed results)

With the Imperial Valley-Miguel 500 kV line initially out of service, the thermal capability was reduced from 9,595 MW to 9,545 MW. The thermal limit was at the Jojoba-Kyrene continuous rating. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,545 MW, the stability limit was restricted by reactive power bucking at 649 MVARs (Point K1 of Figure IOS-14) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 132 MW (Point G1 of Figure IOS-14) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

15. North Gila- Imperial Valley 500 kV Line and N. Gila Series Capacitor Bank

(See Operating Nomogram Figure IOS-15 and Table 15 for detailed results)

With the North Gila-Imperial Valley 500 kV line and the Hassayampa-N. Gila series capacitor bank initially out of service, the thermal capability was reduced from 9,595 MW to 8,966MW. The thermal limits were at the series capacitor rating of the Palo Verde- Devers line and the breakers and disconnect switches ratings of the Hassayampa-Jojoba-Kyrene line under base case conditions. The generation modeled in the base case included three Palo Verde units (3,861MW), one Arlington unit (593MW), two Redhawk units (915MW), one Mesquite unit (499MW), two Harquahala units (1,018MW) and three Gila River units (2,080MW).

For the stability limit, the critical fault was a single-line-to-ground fault at Palo Verde with two Palo Verde-Westwing lines outage. With this net generation of 8,966 MW, the stability was restricted to a net reactive power boosting net of 344 MVARs (Point K1 of Figure IOS-15) at the Palo Verde/Hassayampa 500kV Common Bus. The RAS tripping of a minimum of 862 MW generation (Point G1 of Figure IOS-15) was required if the net reactive power being bucked at the Palo Verde/Hassayampa 500 kV Common Bus, is up to a study maximum of 800 MVARs.

The plant stability and transient voltage dip become less critical for a total generation of 8,712 MW with the removal of one Harquahala unit (254MW). This 8,712 MW generation was limited by a net reactive bucking of 101 MVARs (Point K2 of Figure IOS-15), as metered at the Palo Verde/Hassayampa 500 kV Common Bus without RAS. The RAS tripping of a minimum of 540 MW generation (Point G2 of Figure IOS-15) was required if the net reactive bucking, as metered at the Palo Verde/Hassayampa 500 kV Common Bus, was at 800 MVARs.

It is important to point out that with this category the generation limit is 8,350 MW without a reactive power bucking restriction up to 800 MVARs as metered at the Palo Verde/Hassayampa 500 kV Common Bus.

Due to linear results, including proportionality of unit tripping, it is possible to develop a generic operating nomogram. A specific reactive power bucking restriction and a minimum generation tripping requirement associated with the certain generation schedule can be

determined from the corresponding characteristic curves as shown in the operating nomogram Figure IOS-15.

16. Devers – Valley (SCE) 500 kV line

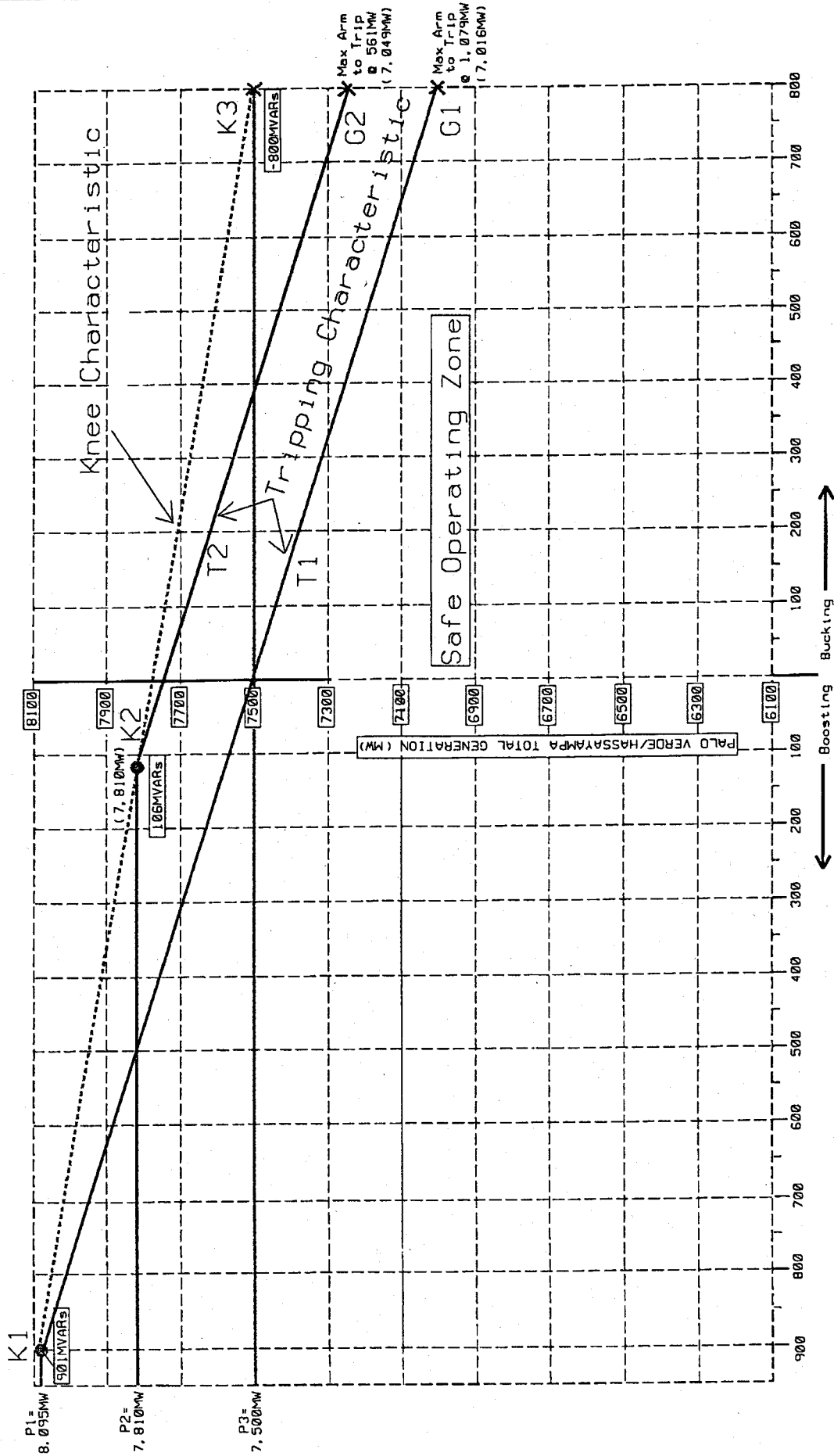
(See Operating Nomogram Figure IOS-16 and Table 16 for detailed results)

With the Devers – Valley (SCE) 500 kV line initially out of service, the thermal capability was reduced from 9,595 MW to 9,454 MW. The thermal limits were at the Hassayampa- North Gila line and the Jojoba-Kyrene continuous ratings. With respect to the transient voltage stability constraint, the limit is the first swing voltage dip at the Devers 230 kV bus for a three-phase fault at the Palo Verde with a Hassayampa-North Gila 500 kV line outage. The current Remedial Action Scheme (RAS) is not applicable to this outage. Gila River units' impact relative to Hassayampa units is a 1 to 1 ratio.

With this net generation of 9,454 MW, the stability limit was restricted by reactive power boosting at 188 MVARs (Point K1 of Figure IOS-16) as measured at the Palo Verde/Hassayampa 500 kV common bus. A further generation curtailment of 488 MW (Point G1 of Figure IOS-16) is necessary if the maximum net reactive bucking at the Palo Verde/Hassayampa 500kV Common bus is 800 MVARs.

FIGURE IOS - 1

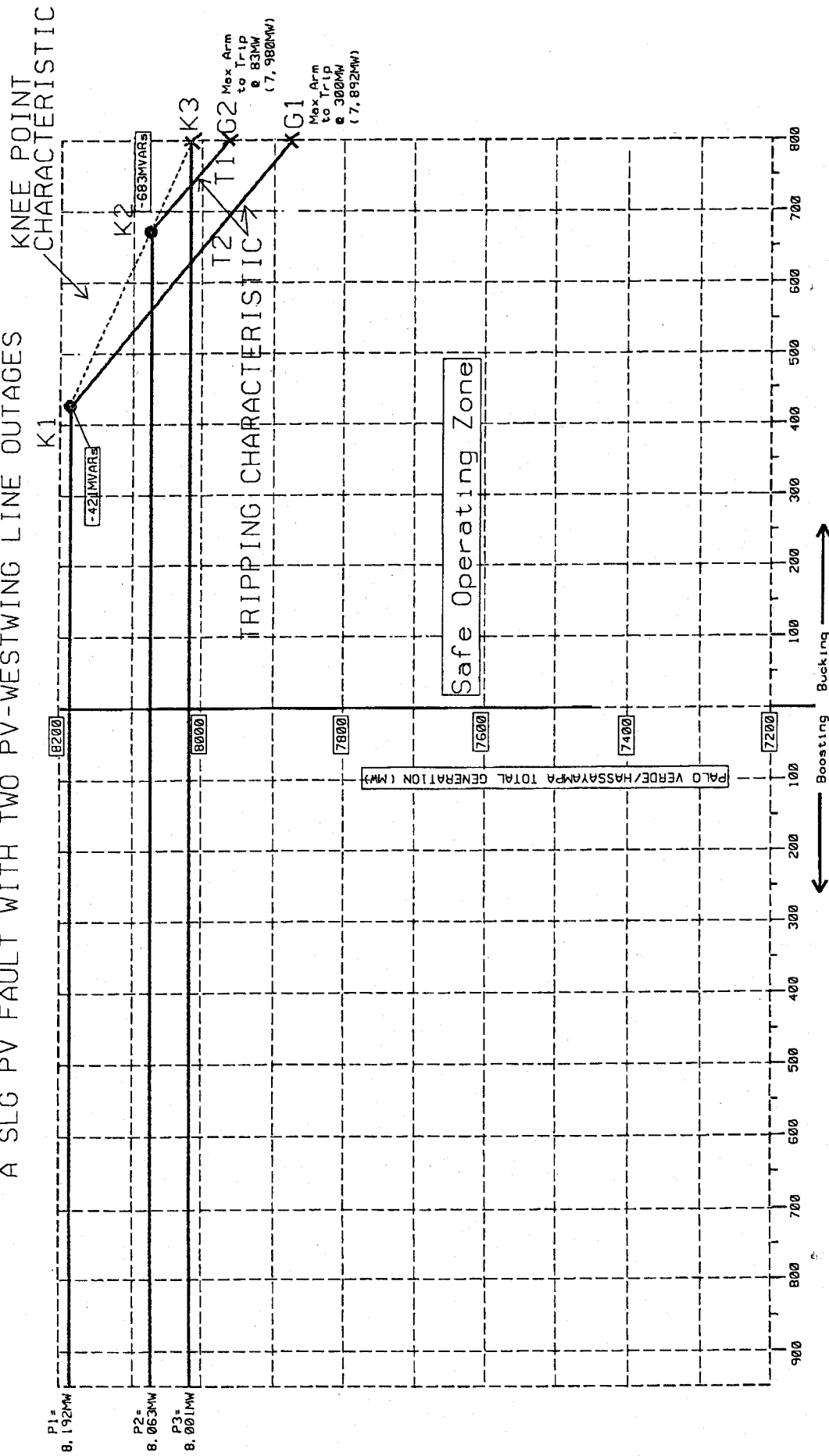
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE PALO VERDE - RUDD LINE INITIALLY OUT OF SERVICE
A SLG PV FAULT WITH TWO PV - WESTWING LINES OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 2

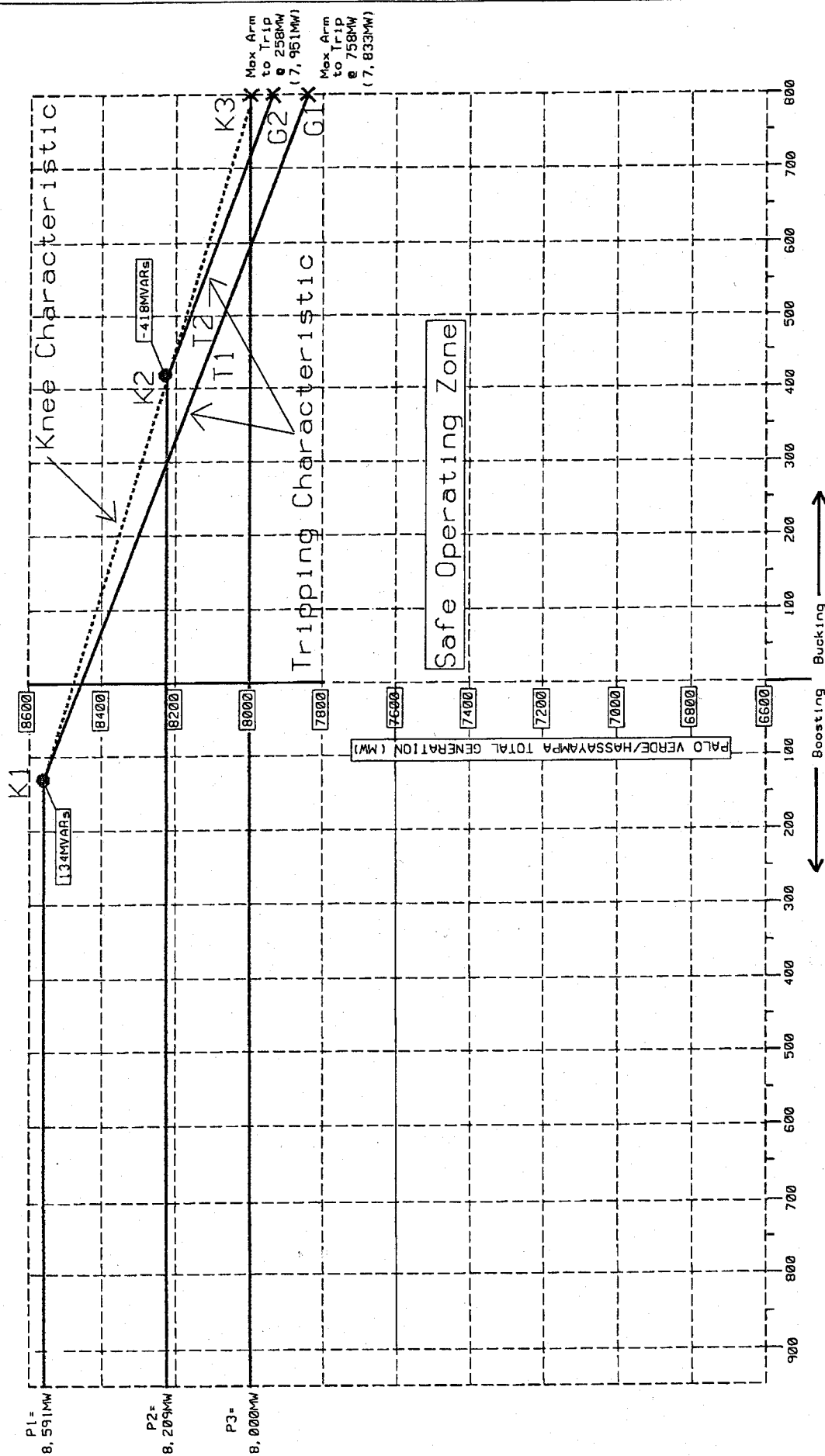
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE PALO VERDE - DEVERS LINE INITIALLY OUT OF SERVICE
A SLG PV FAULT WITH TWO PV-WESTWING LINE OUTAGES



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 3

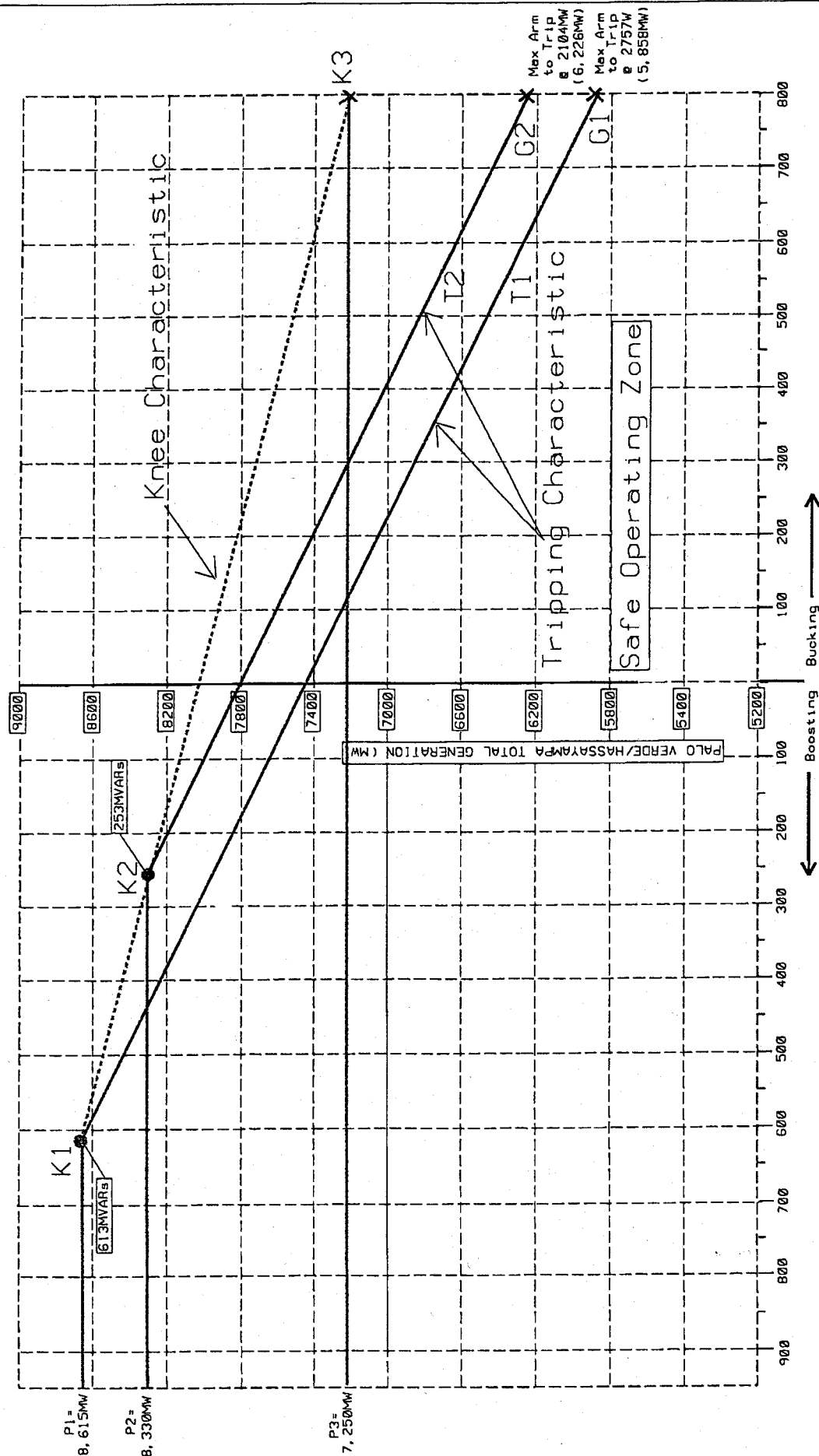
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE HASSAYAMPA - N. GILA LINE INITIALLY OUT OF SERVICE
A SLG PV FAULT WITH TWO PV-WESTWING LINE OUTAGES



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 4

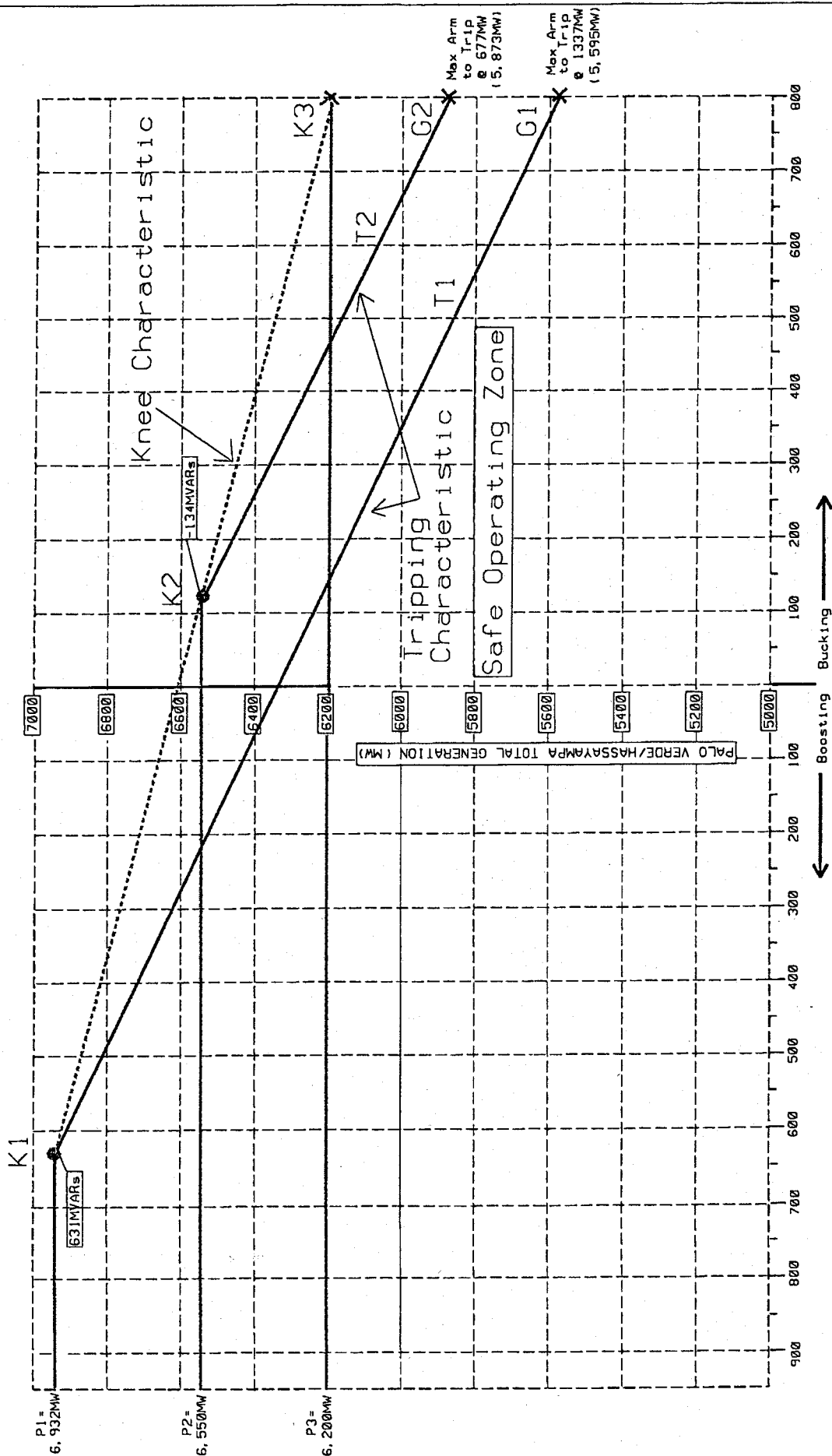
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH ONE PALO VERDE - WESTWING LINE INITIALLY OUT OF SERVICE
A THREE PHASE PV FAULT WITH THE REMAINING PV - WESTWING LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 5

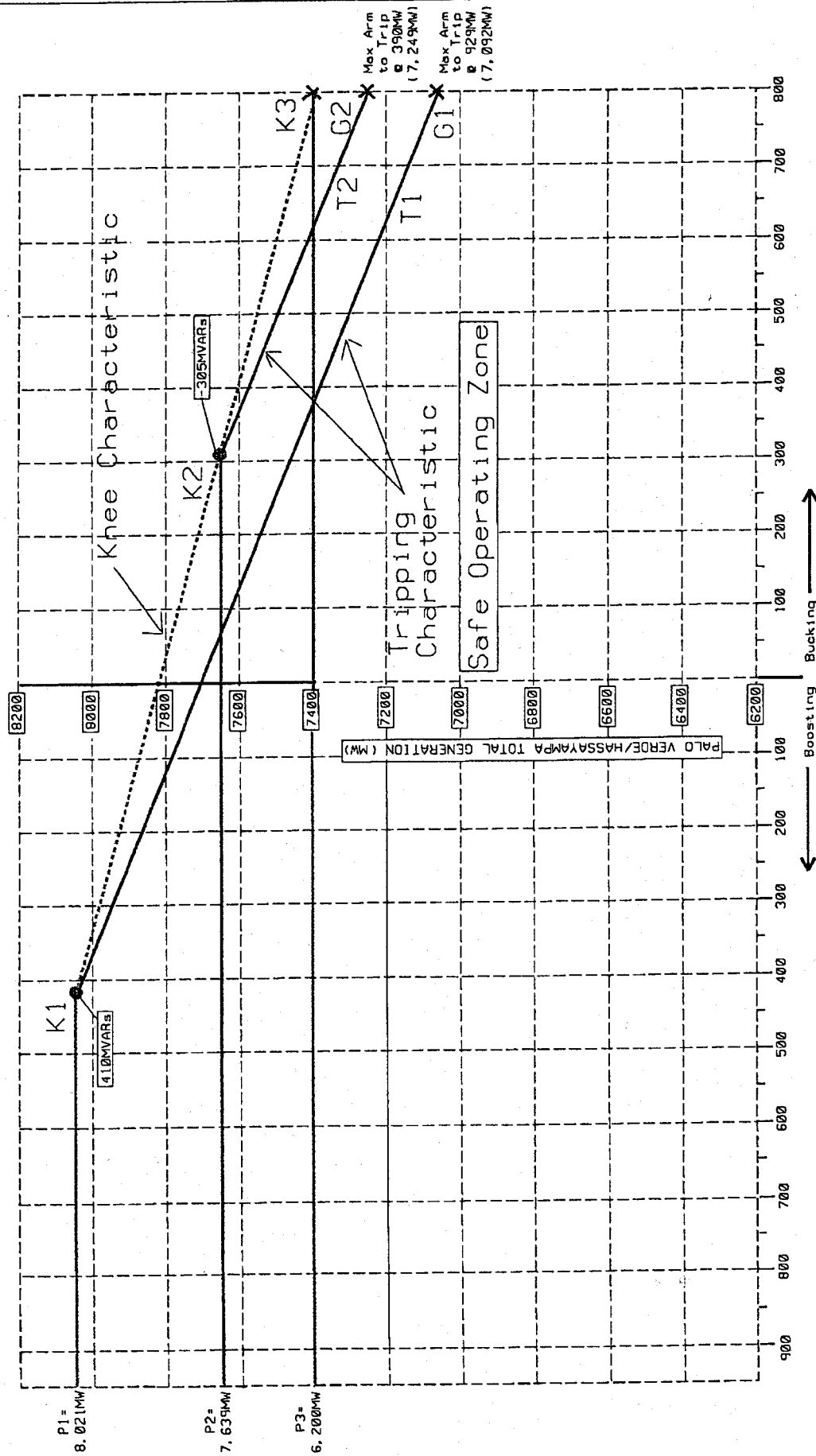
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE HASSAYAMPA - JOJOBA LINE INITIALLY OUT OF SERVICE
A SLG PV FAULT WITH TWO PV-WESTWING LINES OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 6

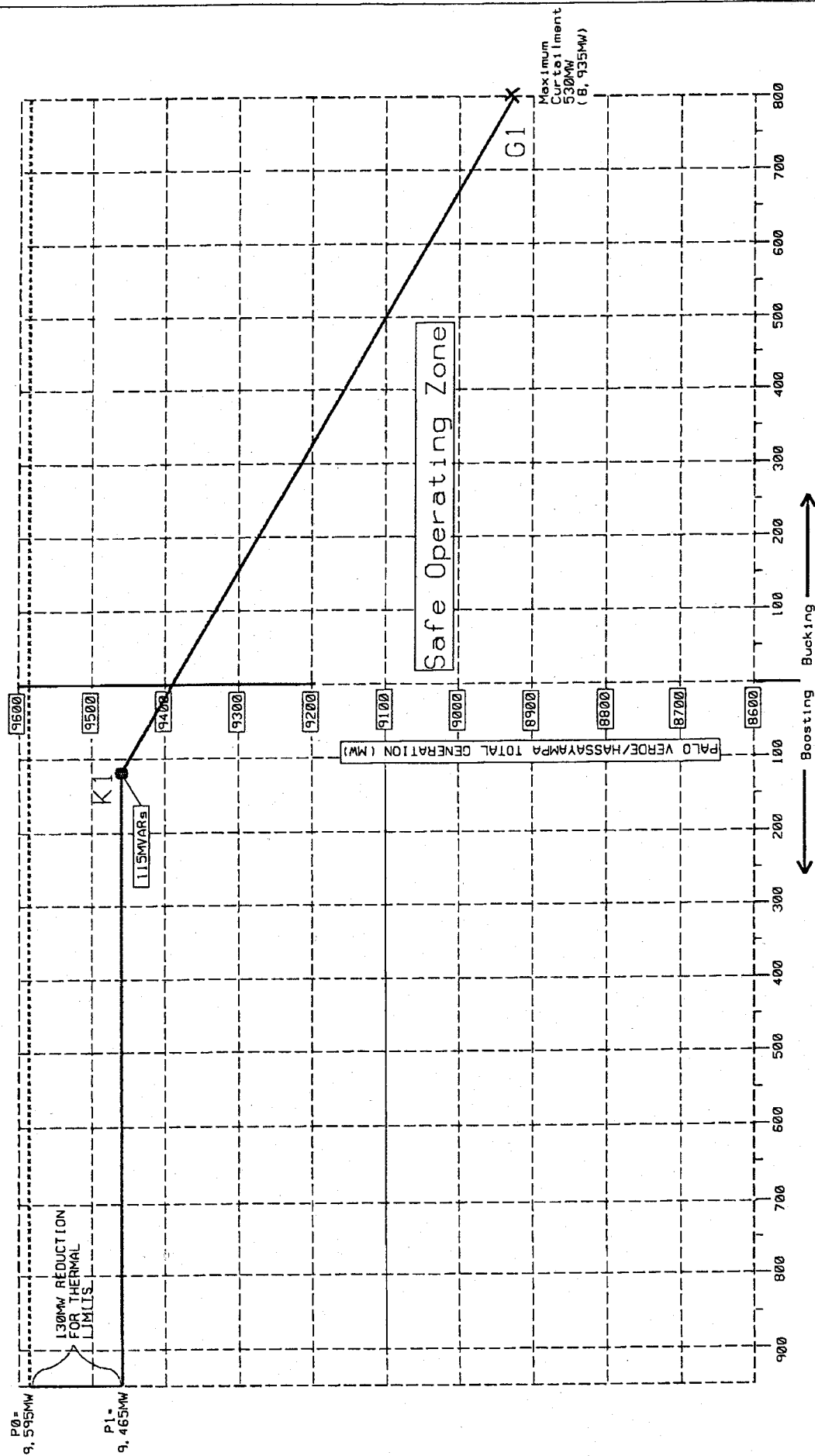
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE JOJOBA - KYRENE LINE INITIALLY OUT OF SERVICE
A SLG PV FAULT WITH TWO PV-WESTWING LINE OUTAGES



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 7

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH ONE PALO VERDE - DEVERS SERIES CAPACITOR BANK (AZ) INITIALLY OUT OF SERVICE
A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N. GILA LINE OUTAGE

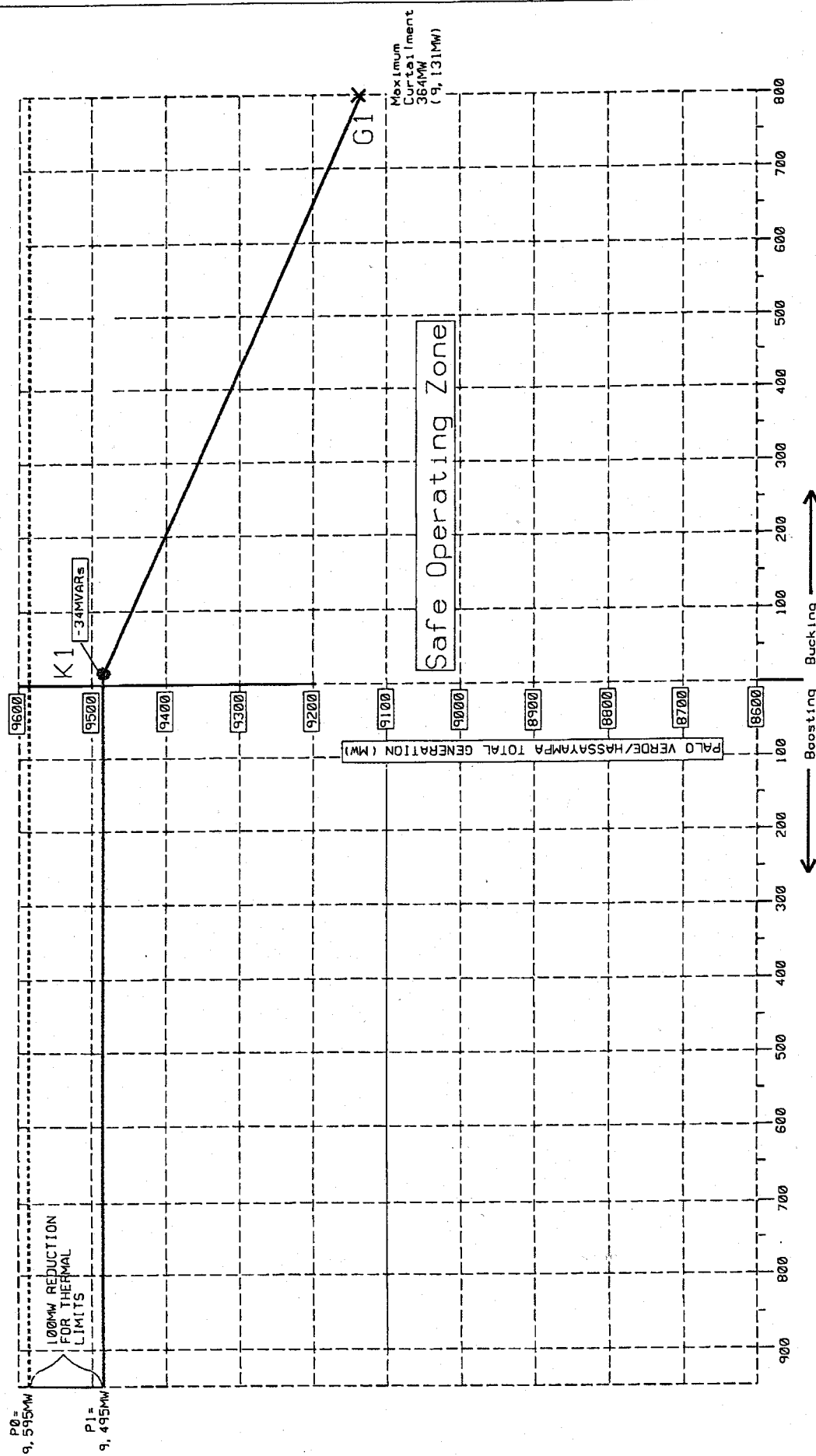


PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 8

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT

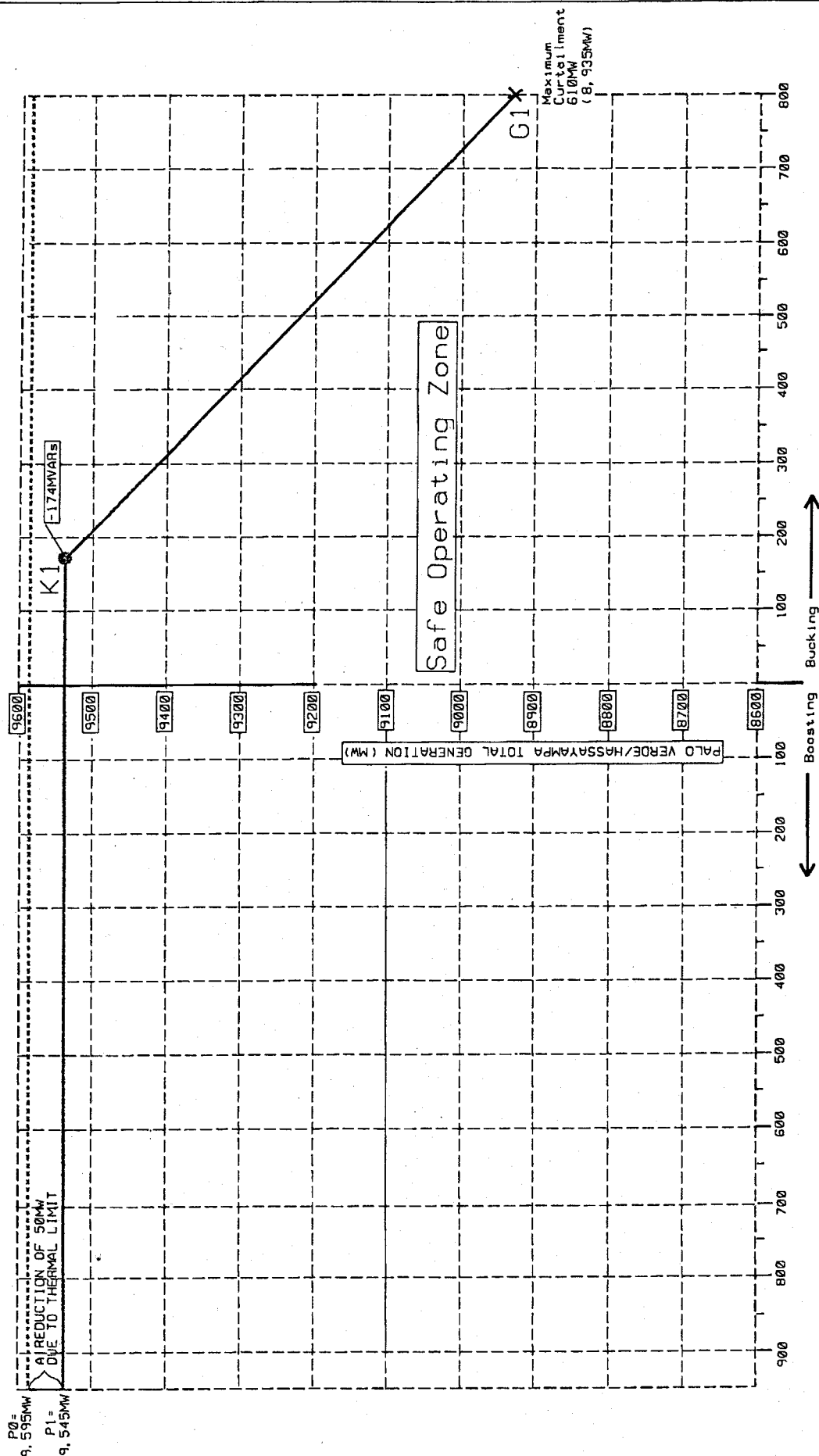
WITH ONE PALO VERDE - DEVERS SERIES CAPACITOR BANK (CA) INITIALLY OUT OF SERVICE
A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N. GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 9

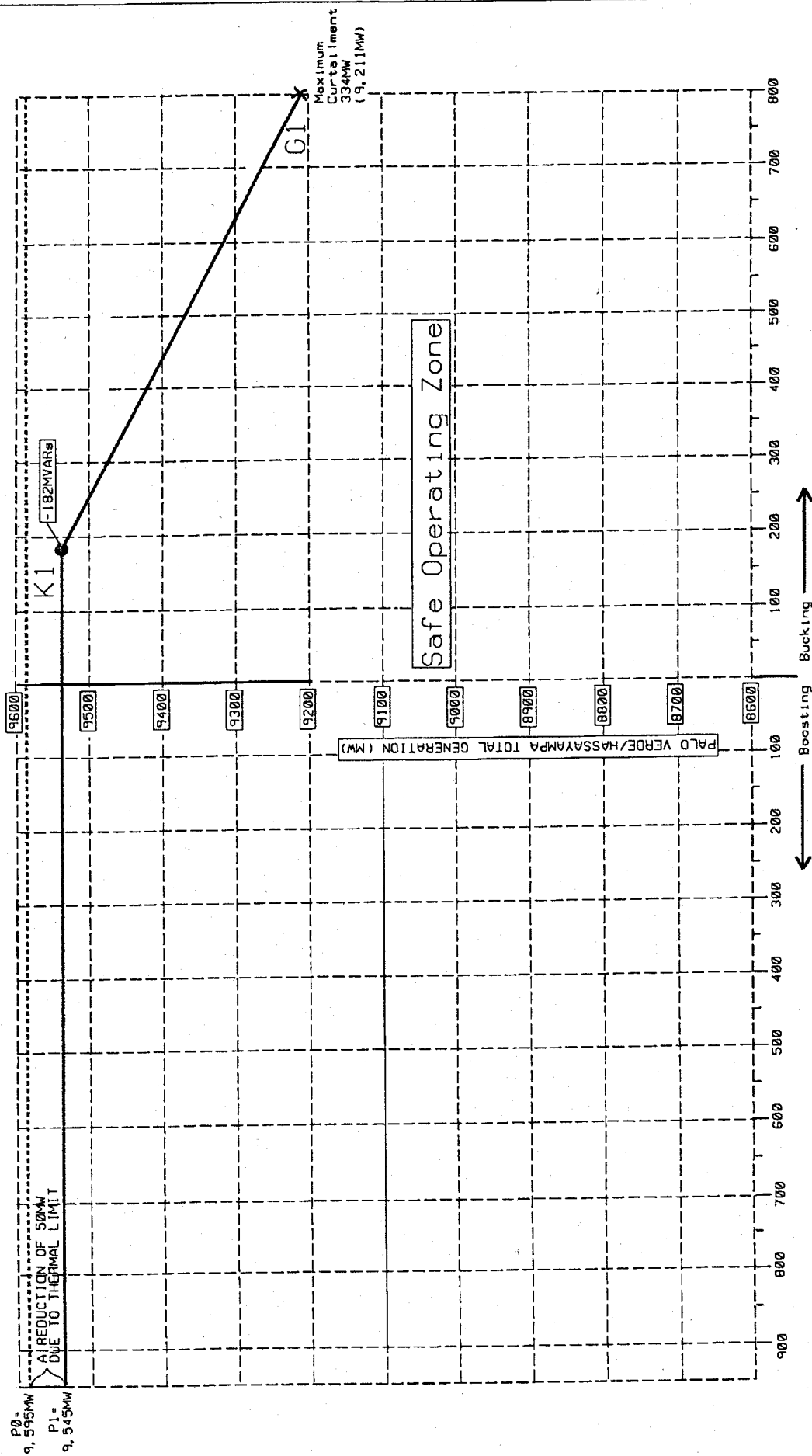
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE HASSAYAMPA - N.GILA SERIES CAPACITOR BANK INITIALLY OUT OF SERVICE
A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N.GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 10

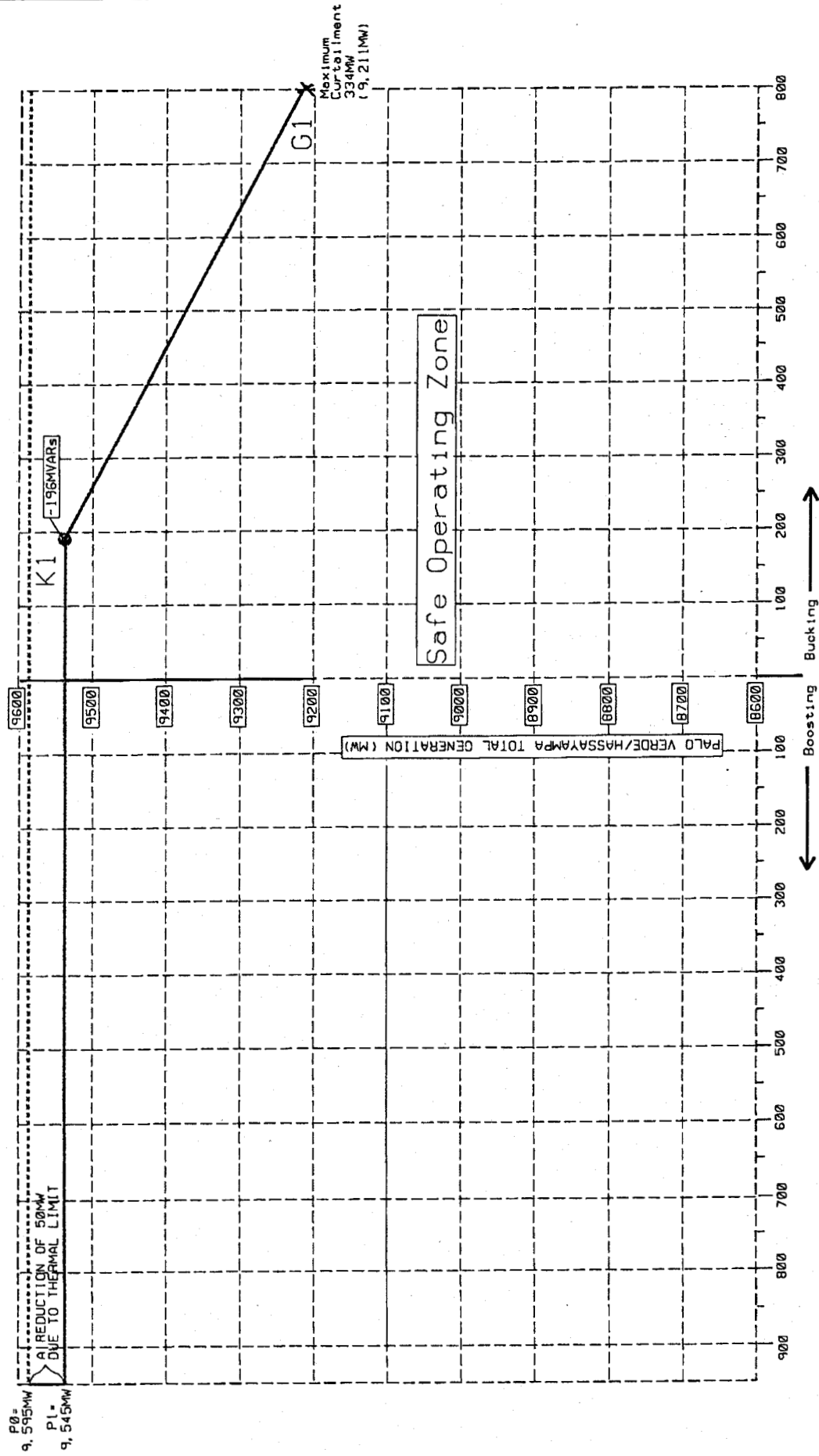
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
 WITH THE N.GILA - IMPERIAL VALLEY SERIES CAPACITOR BANK INITIALLY OUT OF SERVICE
 A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N.GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
 PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 11

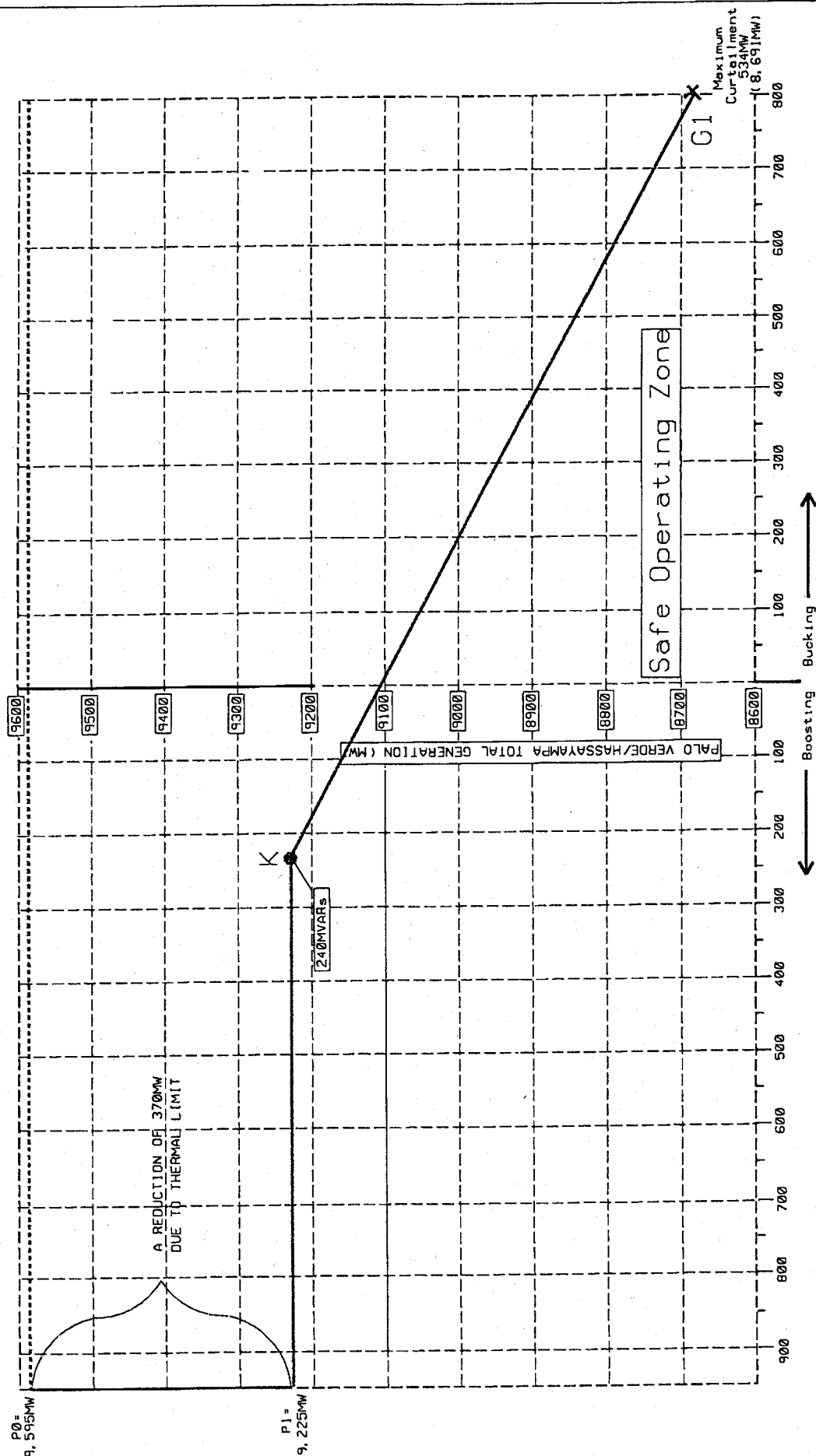
2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE IMPERIAL VALLEY-MIGUEL SERIES CAPACITOR BANK INITIALLY OUT OF SERVICE
A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N.GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE IOS - 12

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE GILA RIVER 500/230kV TRANSFORMER INITIALLY OUT OF SERVICE
A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N.GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE N.GILA -IMPERIAL VALLEY LINE IOS
A SLG PV FAULT WITH TWO PALO VERDE - WESTWING LINE OUTAGES

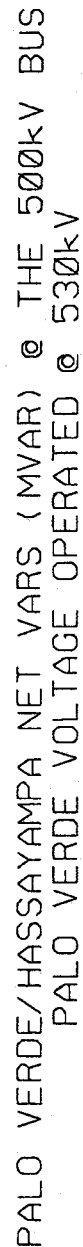
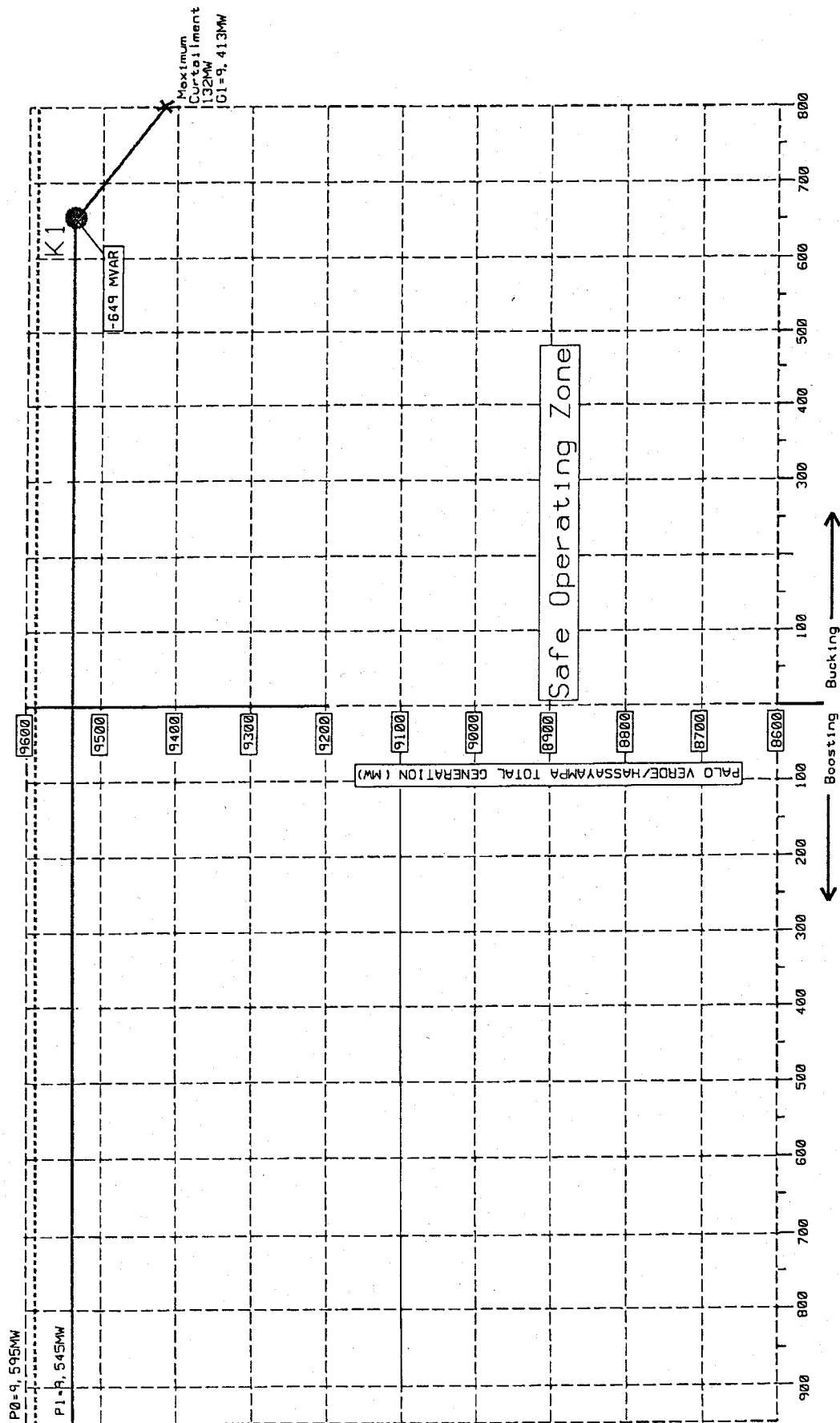


FIGURE ISO-14

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE IMPERIAL VALLEY - MIGUEL LINE IOS

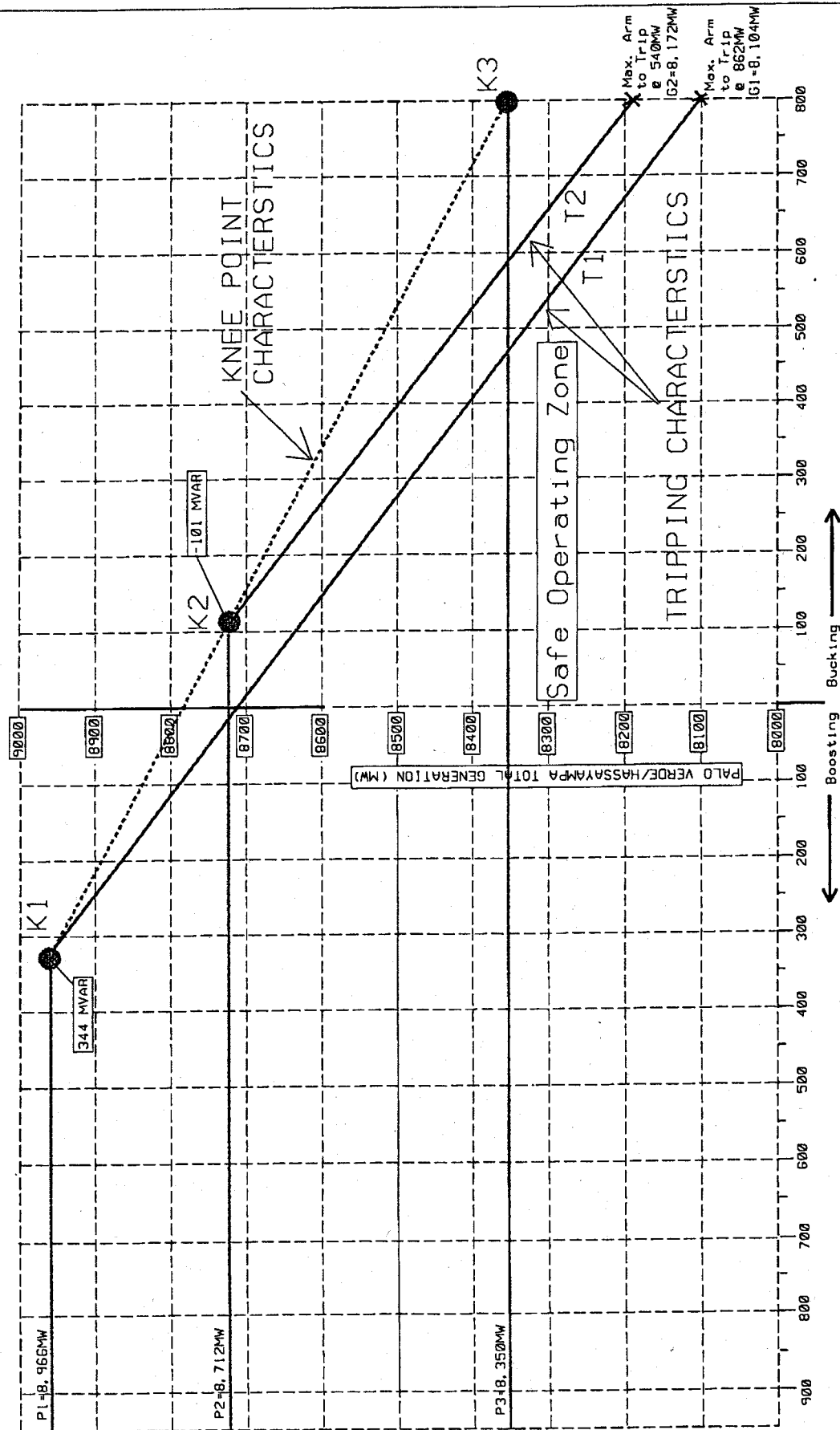
A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N.GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE ISO-15

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE N.GILA - IMPERIAL VALLEY LINE & THE HASSAYAMPA-N.GILA S.C. IOS
A SLG PV FAULT WITH TWO PALO VERDE - WESTWING LINE OUTAGES

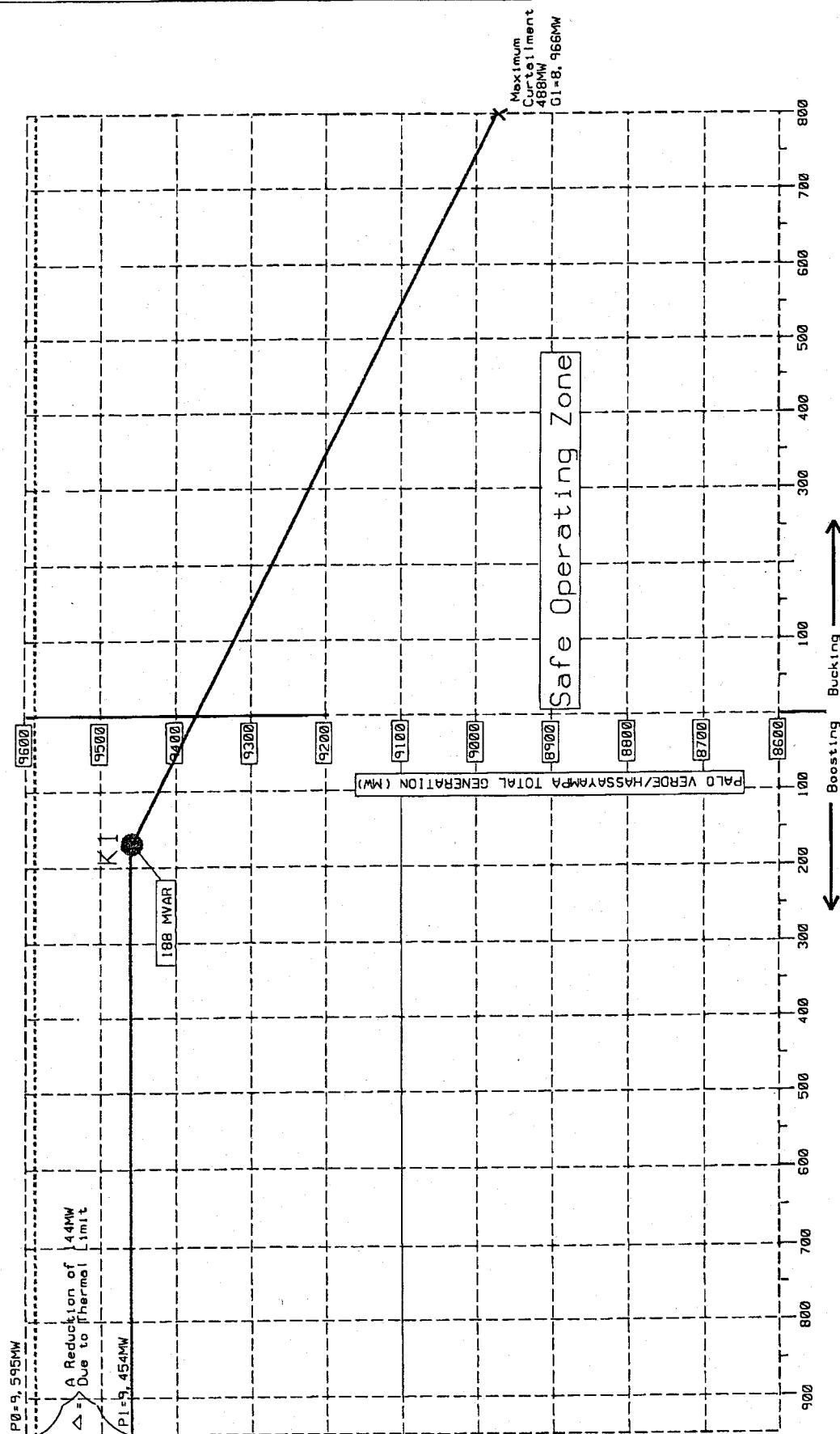


PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

FIGURE ISO-16

2003 SUMMER PALO VERDE TRANSMISSION OPERATING LIMIT
WITH THE DEVERS - VALLEY SCE LINE IOS

A THREE-PHASE PV FAULT WITH THE HASSAYAMPA - N. GILA LINE OUTAGE



PALO VERDE/HASSAYAMPA NET VARS (MVAR) @ THE 500kV BUS
PALO VERDE VOLTAGE OPERATED @ 530kV

TABLE 1

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE PALO VERDE-RUDD LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND THREE GILA RIVER UNIT ON-LINE (TOTAL GEN=8,095MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=845MW, MESQUITE=499MW, HARQUAHALA=667MW AND GILA RIVER=1,560MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	KYR500	DV230	POWER FLOW RESULTS COMMENTS
PF-RUDDIOS1A	PV/HAA BOOSTING AT 901MVAR (PVNG=1072MVAR, HAA=171MVAR)	3861	4234	8095	4781	2820	7601	5415	13135	1.06	1.042	0.93	HAA-NG @ 100.1% OF CONTIN. RATING JOA-KY @ 98.9% OF CONTIN. RATING
PF-RUDDIOS1B	PV/HAA BUCKING AT 800MVAR (PVNG=448MVAR, HAA=351MVAR)	3861	4234	8095	4755	2848	7603	5477	13193	1.06	1.083	1.01	HAA-NG @ 100.0% OF CONTIN. RATING JOA-KY @ 100.0% OF CONTIN. RATING
PF-RUDDIOS2A	PV/HAA BOOSTING AT 106MVAR (PVNG=410MVAR, HAA=304MVAR)	3861	3949	7810	4522	2787	7319	5408	13139	1.06	1.075	1.00	NO SIGNIFICANT PROBLEM
PF-RUDDIOS2B	PV/HAA BUCKING AT 800MVAR (PVNG=484MVAR, HAA=306MVAR)	3861	3849	7810	4525	2797	7322	5413	13144	1.06	1.078	1.01	NO SIGNIFICANT PROBLEM

CASE NO.	N-2 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS	PV500	KYR500	DV230	TRANSIENT STABILITY RESULTS COMMENTS
TS-RUDDIOS1A*	SLG PV FLT, TWO PV-WWG OUT	901	449	NO	NONE		0.88 18.0%	0.75 29.2%	0.77 22.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-RUDDIOS1B*	SLG PV FLT, TWO PV-WWG OUT	-800	419	YES	1079MW (2 UNITS)	TRIP 1 ARLINGTON AND 1 REDHAWK	0.77 29.0%	0.81 27.3%	0.84 17.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-RUDDIOS2A*	SLG PV FLT, TWO PV-WWG OUT	106	469	NO	NONE		0.85 21.0%	0.78 29.5%	0.83 17.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-RUDDIOS2B*	SLG PV FLT, TWO PV-WWG OUT	-800	358	YES	561MW 1 ST UNIT (1 UNIT PLUS)	TRIP 1 HARQUAHALA AND REDHAWK	0.74 32.0%	0.75 32.9%	0.79 21.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 2

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE PALO VERDE-DEVERS LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND THREE GILA RIVER UNIT ON-LINE (TOTAL GEN=8,192MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=499MW, HARQUAHALA=764MW AND GILA RIVER=1,560MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAAGR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS			COMMENTS
										PV500	KYR500	DV230	
PF-DV10S1A	PV/HAA BUCKING AT 421MWVAR (PVNG=58MWVAR, HAA=353MWVAR)	3861	4331	8192	6454	1282	7736	4137	12282	1.08	1.05	1.01	HAA-NG @ 100.1% OF CONTIN. RATING JOA-KY @ 100.2% OF CONTIN. RATING
PF-DV10S1B	PV/HAA BUCKING AT 800MWVAR (PVNG=436MWVAR, HAA=364MWVAR)	3861	4331	8192	6457	1280	7737	4136	12283	1.06	1.06	1.01	HAA-NG @ 99.5% OF CONTIN. RATING JOA-KY @ 99.4% OF CONTIN. RATING
PF-DV10S2A	PV/HAA BUCKING AT 683MWVAR (PVNG=340MWVAR, HAA=343MWVAR)	3861	4202	8063	6335	1277	7612	5285	12282	1.08	1.05	1.01	NO SIGNIFICANT PROBLEM
PF-DV10S2B	PV/HAA BUCKING AT 800MWVAR (PVNG=437MWVAR, HAA=363MWVAR)	3861	4202	8063	6335	1276	7611	4133	12283	1.06	1.06	1.01	NO SIGNIFICANT PROBLEM

CASE NO.	N-2 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS			COMMENTS
									PV500	KYR300	DV230	
TS-DV10S1A*	SLG PV FLT, TWO PV-WWVG OUT	-421	504	NO	NONE				0.84 22.0%	0.76 29.0%	0.99 2.0%	VOLTAGE DIP AT THE LIMIT
TS-DV10S1B*	SLG PV FLT, TWO PV-WWVG OUT	-800	564	YES	300MW TRIP REDHAWK 2 CTs				0.80 26.0%	0.76 30.0%	0.99 2.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-DV10S2A*	SLG PV FLT, TWO PV-WWVG OUT	-683	545	NO	NONE				0.82 24.0%	0.76 30.0%	0.99 2.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-DV10S2B*	SLG PV FLT, TWO PV-WWVG OUT	-800	533	YES	83MW TRIP MESQUITE 1 CT				0.82 24.0%	0.77 29.0%	0.99 2.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 3

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE HASSAYAMPA-NORTH GILA LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=8,591MW)
(PALO VERDE=3,661MW, ARLINGTON =593MW, REDHAWK =915MW, MESQUITE=499MW, HARQUAHALA=764MW AND GILA RIVER=1,959MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAWGR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOB FLOW	SCOT TOTAL	PV500	KYR500	DV230	POWER FLOW RESULTS COMMENTS
PF-NGIOS1A	PV/HAA BOOSTING AT 134MWVAR (PVNG=499MWVAR, HAA=385MWVAR)	3861	4730	8591	6384	1695	8079	4518	12561	1.06	1.06	1.00	PV-DV @ 99.4% OF CONTIN. RATING JOA-KY @ 100.2% OF CONTIN. RATING
PF-NGIOS1B	PV/HAA BUCKING AT 800MWVAR (PVNG=435MWVAR, HAA=365MWVAR)	3861	4730	8591	6380	1700	8080	4529	12568	1.06	1.06	1.01	PV-DV @ 97.3% OF CONTIN. RATING JOA-KY @ 100.1% OF CONTIN. RATING
PF-NGIOS2A	PV/HAA BUCKING AT 418MWVAR (PVNG=112MWVAR, HAA=306MWVAR)	3861	4348	8209	6027	1688	7713	4510	12563	1.06	1.07	1.01	NO SIGNIFICANT PROBLEM
PF-NGIOS2B	PV/HAA BUCKING AT 800MWVAR (PVNG=499MWVAR, HAA=303MWVAR)	3861	4348	8209	6026	1687	7713	4511	12568	1.06	1.07	1.01	NO SIGNIFICANT PROBLEM

CASE NO.	N-2 CONTINGENCY	PV500KV NET VAR	PV/HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS	PV500	KYR500	DV230	TRANSIENT STABILITY RESULTS COMMENTS
TS-NGIOS1A*	SLG PV FLT, TWO PV-WWG OUT	134	505	NO	NONE	TRIP 1 ARLINGTON & REDHAWK 1 CT	0.81 23.0%	0.75 31.0%	0.74 16.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-NGIOS1B*	SLG PV FLT, TWO PV-WWG OUT	-800	486	YES	788MW	TRIP 1 ARLINGTON & REDHAWK 1 CT	0.76 30.0%	0.76 30.0%	0.82 18.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-NGIOS2A*	SLG PV FLT, TWO PV-WWG OUT	-418	361	NO	NONE		0.84 22.0%	0.83 24.0%	0.70 31.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-NGIOS2B*	SLG PV FLT, TWO PV-WWG OUT	-800	389	YES	258MW	TRIP HARQUAHALA 1 CT	0.76 28.0%	0.78 22.0%	0.70 31.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 4

2003 SUMMER PALO VERDE OPERATING LIMITS WITH ONE PALO VERDE-WESTWING LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL T GEN=8,615MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=499MW, HARQUAHALA=667MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS			
										PV500	KYR500	DV230	COMMENTS
PF-WG10S1A	PV/HAA BOOSTING AT 270MVAR (PVNG=618MVAR,HAA=316MVAR)	3861	4754	8615	5279	2834	8114	5423	13168	1.06	1.07	1.00	HAA-NG @ 100.3% OF CONTIN. RATING JOA-KY @ 94.3% OF CONTIN. RATING
N-1 OUTAGE	ALT1: THE 2ND PV-WWG OUTAGE												JOA-KY@100.4% OF EMG RATING PV-RUDD @ 99.6% OF EMG RATING
PF-WG10S1B	PV/HAA BOOSTING AT 613MVAR (PVNG=555MVAR,HAA=345MVAR)	4131	4754	8885	5510	2865	8375	5391	13131	1.06	1.05	1.00	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
PF-WG10S1C	PV/HAA BUCKING AT 800MVAR (PVNG=449MVAR,HAA=351MVAR)	4131	4754	8865	5537	2871	8408	5435	13122	1.06	1.07	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
PF-WG10S2B	PV/HAA BOOSTING AT 253MVAR (PVNG=555MVAR,HAA=302MVAR)	4131	4469	8600	5254	2838	8092	5381	13131	1.06	1.07	1.00	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
PF-WG10S2C	PV/HAA BOOSTING AT 800MVAR (PVNG=493MVAR,HAA=305MVAR)	4131	4469	8600	5265	2829	8094	5388	13138	1.06	1.08	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS				
TS-WG10S1B*	3 PH PV FLT,ONE PV-WWG OUT	613	582	NO	NONE				PV500	KYR500	DV230	COMMENTS	
									31.0%	35.0%	23.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT	
TS-WG10S1C*	3 PH PV FLT,ONE PV-WWG OUT	-800	514	YES	2757MW	TRIP 1 ARLINGTON,2 REDHAWK, 2 HARQUAHALA AND 1 MESQUITE			0.75	0.84	0.85	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT	
									31.0%	23.0%	14.0%		
TS-WG10S2B*	3 PH PV FLT,ONE PV-WWG OUT	253	540	NO	NONE				0.76	0.77	0.78	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT	
									30.0%	30.0%	22.0%		
TS-WG10S2C*	3 PH PV FLT,ONE PV-WWG OUT	-800	411	YES	2104MW	TRIP 1 ARLINGTON,1 REDHAWK, 1 HARQUAHALA AND MESQUITE 1CT			0.73	0.83	0.87	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT	
									33.0%	25.0%	14.0%		

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 5

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE HASSAYAMPA-JOJOBA LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS SEVEN HASSAYAMPA UNITS (NET TOTAL GEN=6.932MW)
(PALO VERDE=3.861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=799MW, HARQUAHALA=764MW) NOTE*

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	KYR500	DV230	POWER FLOW RESULTS COMMENTS
PF-JOA10S1A	PV/HAA BOOSTING AT 631MW (PVNG=1034MW, HAA=403MW)	3861	3071	6932	4103	2777	6880	5503	13242	1.06	1.04	1.00	HAA-NG @ 99.5% OF CONTIN. RATING
PF-JOA10S1B	PV/HAA BUCKING AT 800MW (PVNG=385MW, HAA=405MW)	3861	3071	6932	4112	2770	6882	5517	13248	1.06	1.06	1.00	HAA-NG @ 98.5% OF CONTIN. RATING
PF-JOA10S2A	PV/HAA BUCKING AT 134MW (PVNG=209MW, HAA=343MW)	3861	2689	6550	3764	2736	6500	5488	13246	1.06	1.07	1.00	NO SIGNIFICANT PROBLEM
PF-JOA10S2B	PV/HAA BOOSTING AT 800MW (PVNG=457MW, HAA=343MW)	3861	2689	6550	3772	2728	6500	5494	13247	1.06	1.07	1.00	NO SIGNIFICANT PROBLEM
CASE NO.	CASE DESCRIPTION	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS				PV500	KYR500	DV230	TRANSIENT STABILITY RESULTS COMMENTS
TS-JOA10S1A*	N-2 CONTINGENCY SLG PV FLT, TWO PV-WWG OUT	631	681	NO	NONE					0.81	0.94	0.77	STABILITY LIMIT DV230 @ 20% DIP OVER 40 CYC
TS-JOA10S1B*	SLG PV FLT, TWO PV-WWG OUT	-800	490	YES	1337MW	TRIP 1 ARLINGTON, 1 REDHAWK, 1 HARQUAHALA AND 1 MESQUITE				0.75	0.99	0.85	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-JOA10S2A*	SLG PV FLT, TWO PV-WWG OUT	-134	512	NO	NONE					0.76	0.99	0.78	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-JOA10S2B*	SLG PV FLT, TWO PV-WWG OUT	-800	510	YES	677MW	TRIP 1 HARQUAHALA & MESQUITE 1CT				0.73	0.99	0.81	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

NOTE: GILA RIVER GENERATION WAS NOT INCLUDED SINCE IT WAS ISOLATED FROM THE PALO VERDE/HASSAYAMPA NETWORK HUB.

TABLE 6

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE JOJOBA-KYRENE LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SEVEN HASSAYAMPA UNITS (NET TOTAL GEN=8,021MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=815MW, MESQUITE=848MW, HARQUAHALA=764MW, GILA RIVER=1040MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS		COMMENTS
										PV500	KYR500	DV230
PF-KYIOS1A	PV/HAA BOOSTING AT 410MVAR (PVNG=895MVAR, HAA=485MVAR)	3861	4160	8021	4656	2822	7478	5416	12809	1.06	1.07	1.00 HAA-NG @ 100.0% OF CONTIN. RATING
PF-KYIOS1B	PV/HAA BUCKING AT 800MVAR (PVNG=388MVAR, HAA=412MVAR)	3861	4160	8021	4659	2820	7475	5428	12916	1.06	1.07	1.01 HAA-NG @ 98.9% OF CONTIN. RATING
PF-KYIOS2A	PV/HAA BUCKING AT 305MVAR (PVNG=47MVAR, HAA=352MVAR)	3861	3778	7639	4332	2792	7124	5406	12911	1.06	1.07	1.00 NO SIGNIFICANT PROBLEM
PF-KYIOS2B	PV/HAA BOOSTING AT 800MVAR (PVNG=448MVAR, HAA=352MVAR)	3861	3778	7639	4340	2784	7124	5408	12913	1.06	1.07	1.00 NO SIGNIFICANT PROBLEM
CASE NO.	N-2 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS		TRANSIENT STABILITY RESULTS				
						SLG	PV FLT, TWO PV-WWG OUT	PV500	KYR500	DV230	STABILITY LIMIT	COMMENTS
TS-KYIOS1A*	SLG PV FLT, TWO PV-WWG OUT	410	667	NO	NONE			0.84	0.88	0.77	23.0%	DV230 @ 20% DIP OVER 40 CYC
TS-KYIOS1B*	SLG PV FLT, TWO PV-WWG OUT	-800	574	YES	929MW	TRIP 1 ARLINGTON, AND REDHAWK: 1 CT & 1ST		0.75	0.94	0.82	19.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT
TS-KYIOS2A*	SLG PV FLT, TWO PV-WWG OUT	-305	508	NO	NONE			0.78	0.91	0.76	22.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40 CYC
TS-JOAIO2B*	SLG PV FLT, TWO PV-WWG OUT	-800	509	YES	390MW	TRIP 1 HARQUAHALA UNIT		0.76	0.93	0.80	20.0%	STABILITY LIMIT VOLTAGE DIP AT THE LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 7

2003 SUMMER PALO VERDE OPERATING LIMITS WITH ONE PALO VERDE-DEVERS SERIES CAPACITOR BANK(AZ) INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,465MW)
(PALO VERDE=3,861MW, ARLINGTON =593MW, REDHAWK =915MW, MESQUITE=868MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	KYR500	DV230	POWER FLOW RESULTS COMMENTS
PRE-DISTURBANCE POWER FLOW BASE CASES													
THERMAL LIMIT: 130 MW CURTAILMENT													
PF-DVSC110S1A	PV/HAA BOOSTING AT 608MVAR (PVNG=1079MVAR,HAA=471MVAR)	3851	5804	9465	5487	2456	8923	5458	13216	1.06	1.06	1.02	HAA-HG @ 98.7% OF CONTIN. RATING JOA-KY @ 98.5% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT TWO CURTAILMENT													
PF-DVSC110S1B	PV/HAA BOOSTING AT 115MVAR (PVNG=591MVAR,HAA=478MVAR)	4131	5804	9735	6759	2456	9215	5488	13203	1.08	1.05	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 530 MW CURTAILMENT													
PF-DVSC110S1C	PV/HAA BUCKING AT 808MVAR (PVNG=419MVAR,HAA=387MVAR)	4131	5074	9205	6245	2407	8652	5433	13187	1.08	1.08	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
TRANSIENT STABILITY CASES													
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN CURTAIL	SPECIFIC UNITS				PV500	KYR500	DV230	TRANSIENT STABILITY RESULTS COMMENTS
STABILITY LIMIT: KNEE POINT TWO CURTAILMENT													
TS-DVSC110S1B	3 PH PV FLT, ONE PV-WWG OUT	115	775	NO	NONE					0.82 24.0%	0.81 24.0%	0.75 27.0%	STABILITY LIMIT DV230@ 20% DIP OVER 40CYC
STABILITY LIMIT: 530 MW CURTAILMENT													
TS-DVSC110S1C	3 PH PV FLT, ONE PV-WWG OUT	-800	598	NO	530MW					0.80 26.0%	0.85 23.0%	0.74 27.0%	STABILITY LIMIT DV230@ 20% DIP OVER 40CYC

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 8

2003 SUMMER PALO VERDE OPERATING LIMITS WITH ONE PALO VERDE-DEVERS SERIES CAPACITOR BANK(CA) INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,495MW)
(PALO VERDE=3,861MW, ARLINGTON =893MW, REDHAWK =815MW, MESQUITE=898MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PVHAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS			
										PV500	KYR500	DV230	COMMENTS
PRE-DISTURBANCE POWER FLOW BASE CASES													
THERMAL LIMIT: 100 MW CURTAILMENT													
PF-DVSC1052A	PVHAA BOOSTING AT 623MVAR (PVNG=1006MVAR,HAA=483MVAR)	3861	5834	9495	6428	2528	8856	5495	13241	1.05	1.05	1.01	HAA-NG @ 99.9% OF CONTIN. RATING JDA-KY @ 99.3% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
PF-DVSC1052B	PVHAA BUCKING AT 34MVAR (PVNG=448MVAR,HAA=482MVAR)	4131	5834	9765	6718	2530	9248	5506	13232	1.08	1.06	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 364 MW CURTAILMENT													
PF-DVSC1052C	PVHAA BUCKING AT 600MVAR (PVNG=376MVAR,HAA=424MVAR)	4131	5074	9205	6245	2407	8652	5433	13187	1.08	1.08	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
TRANSIENT STABILITY CASES													
N-1 CONTINGENCY													
CASE NO.		PV500KV NET VAR	PVHAA VAR	RAS SCHEME	GEN CURTAIL	SPECIFIC UNITS				PV500	KYR500	DV230	TRANSIENT STABILITY RESULTS COMMENTS
TRANSIENT STABILITY CASES													
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
TS-DVSC1052B*	3 PH PV FLT, ONE PV-WWG OUT	-34	739	NO	NONE					0.81 23.0%	0.84 22.0%	0.75 26.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC
STABILITY LIMIT: 364 MW CURTAILMENT													
TS-DVSC1052C*	3 PH PV FLT, ONE PV-WWG OUT	-800	672	NO	364MW					0.81 25.0%	0.81 27.0%	0.74 27.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 9

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE HASSAYAMPA-N-GILA SERIES CAPACITOR BANK INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=3,545MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=848MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS	
										PV500	KYR500 DV230 COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES											
THERMAL LIMIT: 50 MW CURTAILMENT											
PF-NGSCIOS1A	PV/HAA BOOSTING AT 610MWVAR (PVNG=1078MWVAR,HAA=468MWAR)	3861	5684	9545	6448	2597	9045	5546	13277	1.06	1.06 1.01 JOA-KY @ 98.8% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT											
PF-NGSCIOS1B	PV/HAA BUCKING AT 174MWVAR (PVNG=418MWVAR,HAA=482MWAR)	4131	5684	9815	6699	2608	9307	5557	13261	1.06	1.00 ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 610 MW CURTAILMENT											
PF-NGSCIOS1C	PV/HAA BUCKING AT 800MWVAR (PVNG=406MWVAR,HAA=384MWAR)	4131	6074	9205	6136	2584	8720	5593	13339	1.06	1.00 ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN CURTAIL	SPECIFIC UNITS			PV500	KYR500	TRANSIENT STABILITY RESULTS DV230 COMMENTS
TRANSIENT STABILITY CASES											
TS-NGSCIOS1B*	STABILITY LIMIT: KNEE POINT W/O CURTAILMENT 3 PH PV FLT,ONE PV-WWVG OUT	-174	793	NO	NONE				0.83 23.0%	0.83 23.0%	0.74 26.0% STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC
TS-NGSCIOS1C*	STABILITY LIMIT: 610MW CURTAILMENT 3 PH PV FLT,ONE PV-WWVG OUT	-800	500	NO	610				0.82 24.0%	0.86 22.0%	0.74 26.0% STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 10

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE N.GILA-IMPERIAL VALLEY SERIES CAPACITOR BANK INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,545MW)
(PALO VERDE=3,361MW, ARLINGTON =593MW, REDHAWK =915MW, MESQUITE=848MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS	
										PV500	KYR500 DV230 COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES											
THERMAL LIMIT: 50 MW CURTAILMENT											
PF-IVSCIOS1A	PV/HAA BOOSTING AT 571MVAR (PVNG=1086MVAR,HAA=495MVAR)	3661	5684	9345	6404	2645	9049	5561	13277	1.06	1.06 1.01 JOA-KY @ 98.4% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT											
PF-IVSCIOS1B	PV/HAA BUCKING AT 182MVAR (PVNG=310MVAR,HAA=482MVAR)	4131	5684	9815	6854	2657	9311	5575	13281	1.06	1.06 ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 334 MW CURTAILMENT											
PF-IVSCIOS1C	PV/HAA BUCKING AT 800MVAR (PVNG=364MVAR,HAA=436MVAR)	4131	5350	9481	6397	2592	8989	5522	13226	1.06	1.07 ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN CURTAIL	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS		
						PV500	KYR500	DV230	COMMENTS		
TRANSIENT STABILITY CASES											
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT											
TS-IVSCIOS1B*	3 PH PV FLT,ONE PV-WWG OUT	-182	792	NO	NONE	0.83 23.0%	0.84 22.0%	0.74 26.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC		
STABILITY LIMIT: 334 MW CURTAILMENT											
TS-IVSCIOS1C*	3 PH PV FLT,ONE PV-WWG OUT	-800	668	NO	334	0.80 26.0%	0.84 23.0%	0.75 26.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC		

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 11

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE IMPERIAL VALLEY-MIGUEL SERIES CAPACITOR BANK INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS, AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,545MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=948MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HA/GR GEN	PVHAA TOT	PV EAST	PV WEST	PV TRF	EDR FLOW	SCOT TOTAL	POWER FLOW RESULTS		
										PV500	KYR500	DV230 COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES												
THERMAL LIMIT: 50 MW CURTAILMENT												
	PVHAA BOOSTING AT 563MVAR (PVNG=1059MVAR,HAA=494MVAR)	3861	5684	9545	6378	2674	9032	5571	13278	1.06	1.06	1.01 JDA-KY @ 100.1% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT												
	PVHAA BUCKING AT 196MVAR (PVNG=2368MVAR,HAA=492MVAR)	4131	5684	9815	6626	2685	9311	5580	13282	1.06	1.07	1.00 ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 334 MW CURTAILMENT												
	PVHAA BUCKING AT 800MVAR (PVNG=384MVAR,HAA=435MVAR)	4131	5350	8441	6397	2592	8889	5522	13226	1.06	1.07	1.01 ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN CURTAIL		SPECIFIC UNITS			PV500	KYR500	TRANSIENT STABILITY RESULTS DV230 COMMENTS

TRANSIENT STABILITY CASES

STABILITY LIMIT: KNEE POINT W/O CURTAILMENT											
TS-MIGSCIO51B* 3 PH PV FLT, ONE PV-WING OUT											
		-196	770	NO	NONE	0.84 22.0%	0.85 22.0%	0.75 25.0%	0.84 22.0%	0.75 25.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC
STABILITY LIMIT: 334 MW CURTAILMENT											
TS-MIGSCIO51C* 3 PH PV FLT, ONE PV-WING OUT											
		-800	678	NO	334	0.80 25.0%	0.84 23.0%	0.75 25.0%	0.80 25.0%	0.75 25.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 12

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE GILA RIVER 500/230 KV TRANSFORMER INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,225MW)
(PALO VERDE=3,851MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=988MW, HARQUAHALA=1148MW AND GILA RIVER=1,700MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAAIGR GEN	PVHAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	KYR500	POWER FLOW RESULTS	
												DV230	COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES													
THERMAL LIMIT: 370 MW CURTAILMENT													
PF-GILA0301A	PVHAA BUCKING AT 438MWVAR (PVNG=64MWVAR,HAA=602VAR)	3861	5364	9225	6445	2756	9205	5638	13313	1.06	1.07	1.01	HAA-NG @ 99.5% OF CONTIN. RATING JOA-KV @ 100.0% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
PF-GILA0301B	PVHAA BOOSTING AT 240MWVAR (PVNG=740MWVAR,HAA=600MWVAR)	4131	5364	9495	6895	2779	9474	5642	13308	1.06	1.08	1.00	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 534 MW CURTAILMENT													
PF-GILA0301C	PVHAA BUCKING AT 800MWVAR (PVNG=362MWVAR,HAA=438MWVAR)	4131	4830	8961	6204	2739	8942	5563	13180	1.06	1.07	1.02	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PVHAA VAR	RAS SCHEME	GEN CURTAIL	SPECIFIC UNITS			PV500	KYR500	TRANSIENT STABILITY RESULTS DV230		COMMENTS
TRANSIENT STABILITY CASES													
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
TS-GILA0301B*	3 PH PV FLT,ONE PV-WWVG OUT	240	778	NO	NONE				0.84 22.0%	0.84 22.0%	0.74 26.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC	
STABILITY LIMIT: 534 MW CURTAILMENT													
TS-GILA0301C*	3 PH PV FLT,ONE PV-WWVG OUT	-800	514	NO	534				0.79 27.0%	0.84 23.0%	0.74 28.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC	

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 13

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE N.GILA-IMPERIAL VALLEY LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SEVEN HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=3,966MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=499MW, HARQUAHALA=1,018MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVWG GEN	HAWGR GEN	PVHAA TOT	PV EAST	PV WEST	PV TRF	ECR FLOW	ECIT TOTAL	PV500	KYR500	DY230	POWER FLOW RESULTS COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES													
THERMAL LIMIT: 629 MW CURTAILMENT													
PF-IVDS1A	PVHAA BOOSTING AT 343MVAR (PVWG=733MVAR, HAA=411MVAR)	3161	5105	8965	6564	1888	8452	5135	12848	1.08	1.07	1.00	PV-DV @ 99.7% OF CONTIN. RATING JOA-KY @ 99.4% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT													
PF-IVDS1A	PVHAA BOOSTING AT 343MVAR (PVWG=733MVAR, HAA=411MVAR)	3161	5105	8965	6564	1888	8452	5135	12848	1.06	1.07	1.00	PV-DV @ 98.7% OF CONTIN. RATING JOA-KY @ 98.4% OF CONTIN. RATING
STABILITY LIMIT: MAX BUCKING													
PF-IVDS1B	PVHAA BUCKING AT 800MVAR (PVWG=389MVAR, HAA=411MVAR)	3161	5105	8965	6580	1875	8455	5145	12852	1.08	1.07	1.00	PV-DV @ 98.5% OF CONTIN. RATING JOA-KY @ 98.1% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT													
PF-IVDS1C	PVHAA BUCKING AT 103MVAR (PVWG=265MVAR, HAA=389MVAR)	3161	4851	8712	6337	1873	8210	5132	12848	1.06	1.07	1.00	NO SIGNIFICANT PROBLEM
STABILITY LIMIT: MAX BUCKING													
PF-IVDS1D	PVHAA BUCKING AT 800MVAR (PVWG=411MVAR, HAA=389MVAR)	3161	4851	8712	6344	1866	8210	5137	12851	1.06	1.08	1.00	NO SIGNIFICANT PROBLEM
TRANSIENT STABILITY CASES													
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
TS-IVDS1A*	SLG PV FLT, TWO PV-WWG OUT	243	465	NO	NONE					0.86	0.80	0.75	STABILITY LIMIT DY230 @ 20% DIP OVER 40CYC
STABILITY LIMIT: MAX BUCKING													
TS-IVDS1B*	SLG PV FLT, TWO PV-WWG OUT	-800	437	NO	862	1 REDHAWK AND 1 HARQUAHALA				0.76	0.77	0.80	STABILITY LIMIT PV500 @ VOLTAGE DIP LIMIT
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
TS-IVDS1C*	SLG PV FLT, TWO PV-WWG OUT	-103	384	NO	NONE					0.85	0.80	0.75	STABILITY LIMIT DY230 @ 20% DIP OVER 40CYC
STABILITY LIMIT: MAX BUCKING													
TS-IVDS1B*	SLG PV FLT, TWO PV-WWG OUT	-800	368	NO	540	1 REDHAWK CT AND 1 HARQUAHALA				0.78	0.79	0.75	STABILITY LIMIT KY500 @ VOLTAGE DIP LIMIT

* NOTE: THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 14

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE IMPERIAL VALLEY-MIGUEL LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SIX HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,545MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=948MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAAGR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	PV500	KYR500	DV230	POWER FLOW RESULTS COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES													
THERMAL LIMIT: 50 MW CURTAILMENT													
PF-MIGIOS1A	PV/HAA BOOSTING AT 637MWVAR (PVNG=1076MWVAR, HAA=419MWVAR)	3861	5684	9545	6633	2401	9034	5303	13280	1.06	1.06	1.00	JOA-KY @ 99.5% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT WISDMW CURTAILMENT													
PF-MIGIOS1B	PV/HAA BUCKING AT 640MWVAR (PVNG=1531MWVAR, HAA=486MWVAR)	4131	5684	9815	6888	2431	9329	5326	13266	1.06	1.07	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: 132 MW CURTAILMENT													
PF-MIGIOS1C	PV/HAA BUCKING AT 800MWVAR (PVNG=323MWVAR, HAA=477MWVAR)	4131	5552	8683	6778	2424	9202	5323	13266	1.06	1.07	1.01	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
TRANSIENT STABILITY CASES													
STABILITY LIMIT: KNEE POINT TWO CURTAILMENT													
TS-MIGIOS1B*	3 PH PV FLT, ONE PV-WWNG OUT	-649	639	NO	NONE					0.78 28.0%	0.80 27.8%	0.72 28.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC
STABILITY LIMIT: 132 MW CURTAILMENT													
TS-MIGIOS1C*	3 PH PV FLT, ONE PV-WWNG OUT	-800	596	NO	132					0.76 30.0%	0.80 27.0%	0.70 31.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC PV500 @ 30% V DP LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 15

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE N.GILA-IMPERIAL VALLEY LINE AND N.GILA SC INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, SEVEN HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,988MW)
(PALO VERDE=3,861MW, ARLINGTON=593MW, REDHAWK=915MW, MESQUITE=489MW, HARQUAHALA=1,016MW AND GILA RIVER=2,089MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EDR FLOW	SCIT TOTAL	PV500	KYR500	DV230	POWER FLOW RESULTS COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES													
THERMAL LIMIT: 629 MW CURTAILMENT													
PF-SDGEIOS1A	PV/HAA BOOSTING AT 344MVAR (PVNG=755MVAR,HAA=411MVAR)	3861	5105	8966	8568	1883	8452	5133	12946	1.06	1.07	1.00	PV-DV @ 98.8% OF CONTIN. RATING JOA-KY @ 99.4% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT													
PF-SDGEIOS1A	PV/HAA BOOSTING AT 344MVAR (PVNG=755MVAR,HAA=411MVAR)	3861	5105	8966	8568	1883	8452	5133	12946	1.06	1.07	1.00	PV-DV @ 98.8% OF CONTIN. RATING JOA-KY @ 99.4% OF CONTIN. RATING
STABILITY LIMIT: MAX BUCKING													
PF-SDGEIOS1B	PV/HAA BUCKING AT 800MVAR (PVNG=389MVAR,HAA=411MVAR)	3861	5105	8966	8584	1871	8455	5143	12951	1.06	1.07	1.00	PV-DV @ 98.0% OF CONTIN. RATING JOA-KY @ 99.7% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT													
PF-SDGEIOS1C	PV/HAA BUCKING AT 101MVAR (PVNG=267MVAR,HAA=388MVAR)	3861	4851	8712	8341	1868	8209	5130	12849	1.06	1.07	1.00	NO SIGNIFICANT PROBLEM
STABILITY LIMIT: MAX BUCKING													
PF-SDGEIOS1D	PV/HAA BUCKING AT 800MVAR (PVNG=431MVAR,HAA=389MVAR)	3861	4851	8712	8349	1861	8210	5138	12951	1.06	1.08	1.00	NO SIGNIFICANT PROBLEM
CASE NO.	N-2 CONTINGENCY	PV500KV NET VAR	PV/HAA VAR	RAS SCHEME	GEN TRIP	SPECIFIC UNITS			TRANSIENT STABILITY RESULTS COMMENTS				
TRANSIENT STABILITY CASES													
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
TS-SDGEIOS1A*	SLG PV FLT,TWO PV-WWG OUT	344	465	NO	NONE				0.86	0.80	0.75	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC	
STABILITY LIMIT: MAX BUCKING													
TS-SDGEIOS1B*	SLG PV FLT,TWO PV-WWG OUT	-800	436	NO	862 1 REDHAWK AND 1 HARQUAHALA				0.76	0.77	0.80	STABILITY LIMIT PV500 @ VOLTAGE DIP LIMIT	
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT													
TS-SDGEIOS1C*	SLG PV FLT,TWO PV-WWG OUT	-101	393	NO	NONE				0.85	0.80	0.78	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC	
STABILITY LIMIT: MAX BUCKING													
TS-SDGEIOS1B*	SLG PV FLT,TWO PV-WWG OUT	-800	367	NO	540 1 REDHAWK CT AND 1 HARQUAHALA				0.78	0.79	0.78	STABILITY LIMIT KY500 @ VOLTAGE DIP LIMIT	

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

TABLE 16

2003 SUMMER PALO VERDE OPERATING LIMITS WITH THE DEVERS- VALLEY (SCE) LINE INITIALLY OUT OF SERVICE
WITH THREE PALO VERDE UNITS, EIGHT HASSAYAMPA UNITS AND FOUR GILA RIVER UNIT ON-LINE (TOTAL GEN=9,434MW)
(PALO VERDE=3,861MW, ARLINGTON =593MW, REDHAWK =815MW, MESQUIT=857MW, HARQUAHALA=1148MW AND GILA RIVER=2,080MW)

CASE NO.	CASE DESCRIPTION	PVNG GEN	HAA/GR GEN	PV/HAA TOT	PV EAST	PV WEST	PV TRF	EOR FLOW	SCIT TOTAL	POWER FLOW RESULTS		
										PV500	DV230	COMMENTS
PREDISTURBANCE POWER FLOW BASE CASES												
THERMAL LIMIT: 141 MW CURTAILMENT												
PF-DV1031A	PV/HAA BOOSTING AT 471MVAR (PVNG=955MVAR,HAA=484MVAR)	3861	5593	9454	6503	2450	8953	5485	13246	1.06	1.01	HAA-NG @ 99.9% OF CONTIN. RATING JOA-KY @ 98.9% OF CONTIN. RATING
STABILITY LIMIT: KNEE POINT W/100MW CURTAILMENT												
PF-DV1031B	PV/HAA BOOSTING AT 188MVAR (PVNG=671MVAR,HAA=483MVAR)	4131	5593	9723	6775	2438	9214	5484	13067	1.06	1.02	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
STABILITY LIMIT: ADDITIONAL 488 MW CURTAILMENT												
PF-DV1031C	PV/HAA BUCKING AT 800MVAR (PVNG=323MVAR,HAA=477MVAR)	4131	5105	9236	6526	2217	8745	5846	12554	1.06	1.02	ADDED 7% GEN MARGIN TO PV FOR STABILITY RUN
CASE NO.	N-1 CONTINGENCY	PV500KV NET VAR	PV-HAA VAR	RAS SCHEME	GEN CURTAIL	SPECIFIC UNITS		TRANSIENT STABILITY RESULTS		COMMENTS		
						PV500	KYR500	PV500	KYR500	DV230	COMMENTS	
TRANSIENT STABILITY CASES												
STABILITY LIMIT: KNEE POINT W/O CURTAILMENT												
TS-DV1031B*	3 PH PV FLT, ONE PV-WWVG OUT	-188	735	NO	NONE			0.78 28.0%	0.79 28.0%	0.70 31.0%	0.70 31.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC
STABILITY LIMIT: 132 MW CURTAILMENT												
TS-DV1031C*	3 PH PV FLT, ONE PV-WWVG OUT	-800	619	NO	488			0.76 30.0%	0.78 27.0%	0.70 31.0%	0.70 31.0%	STABILITY LIMIT DV230 @ 20% DIP OVER 40CYC PV500 @ 30% V DIP LIMIT

* NOTE: * THESE CASES WERE REPRESENTED WITH THE STABILITY LIMIT.

APPENDIX "C"



Leesa Nayudu
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April 14, 2003

Harry Judd & Alan Kessler
ACC Consultants/Independent Monitor
Accion Group
244 N. Main St.
Concord, NH 03301-5041

Dear Independent Monitor (Harry & Alan):

Thank you for attempting to address our concerns with the Respondent Certification in your role as the Independent Monitor. As you know, the language of the Respondent Certification was one of the primary reasons we elected not to participate in this particular solicitation. While your proposed language clarifications were helpful, they did not completely address our concerns, and thus, are not acceptable to us at this time. Because we remain committed to supporting fair and competitive markets in Arizona and participating in future solicitations, we would like to suggest a workshop to address these issues. We offer the following specific concerns with the order and proposed Certification language that we would like to see addressed at the workshop:

- ❑ We are concerned with the use of the term "market manipulation," which we do not believe is clearly defined or understood by the industry, the FERC, or the State of Arizona. "Market manipulation" must be clearly defined if it is to be used in any type of certification. For example, we would not object to certifying that we, as potential Respondents, will not intentionally engage in specific unlawful acts, e.g., "intentional physical withholding of the output of an electrical facility by falsely declaring that the facility has been forced out of service or otherwise become unavailable, under circumstances when it would normally be offered in a competitive market, with the intent of creating artificial or distorted market prices". Otherwise, use of the undefined term "market manipulation" may lead to frivolous accusations and unnecessary hearings which are expensive, time consuming, and detrimental to robust, fair and competitive markets.
- ❑ It is quite possible that our interpretation of the order/certification language may not reflect the Commission's intent, which may (and should) have been to allow accused parties to exercise their due process rights with FERC or the courts, as appropriate. We sincerely hope that an ACC hearing would not occur until after a final and non-appealable order (a "Final Order") is issued by the appropriate jurisdictional authority

Semptra Energy Resources is not the same company as SDG&E/SoCalGas, the utilities. Semptra Energy Resources is not regulated by the California Public Utilities Commission, and you do not have to buy Semptra Energy Resources' products or services to continue to receive quality regulated service from the utilities.

(i.e., FERC/courts) finding that specific unlawful acts were in fact intentionally committed, and that those acts had a direct, material and adverse effect on Arizona, as part of the wholesale power markets in the Western Electricity Coordinating Council (WECC), during a solicitation or affecting performance under and during the term of a contract executed between Respondent and APS or TEP as a result of a solicitation. By executing a Certification, a Respondent can make no representation regarding the possible actions of third parties over whom Respondent has no control, including any affiliates of Respondent. Any Final Order with respect to such third parties does not necessarily apply to Respondent. Any Respondent Certification required should confirm all of these understandings.

- ❑ There should be similar reciprocal protections for Respondents, as market participants, that preclude the Arizona utilities subject to ACC jurisdiction from engaging in the same type of prohibited behavior.
- ❑ Any penalties assessed as a result of a Final Order must be within the existing authority and jurisdiction of the authority assessing them (e.g., the ACC), and should be proportional to the detrimental impact suffered. While the ACC may assess such penalties on APS and/or TEP, we are not aware of any authority that the ACC (in lieu of FERC or the courts) currently has to penalize wholesale merchant generators or power marketers.
- ❑ We are also unwilling to commit to a commercial contract that contains a broad "regulatory out" for the Buyer that may force us to incur uncompensated losses (e.g., hedging or lost opportunity costs). While we whole-heartedly support the inclusion of Mobile-Sierra language in our contracts, we reiterate our concerns (which were raised at pre-bid meetings) about the apparent legal conflict and commercial incompatibility between allowing the ACC, as opposed to the FERC or the courts, to "rescind" (abrogate) contracts, and the Mobile-Sierra language that was appropriately included in the draft contracts proposed by the utilities.
- ❑ We do not object to certifying that we have "reviewed the Arizona Public Service Company Standards of Conduct for the Track B Competitive Procurement Process (particularly Section II.C. (Communication Protocol)) and that [we] will use reasonable efforts to comply with those standards, particularly Section II.C., and will require [our] officers, directors, employees and consultants to comply with all the provisions of those Standards of Conduct that apply to [our] activities."
- ❑ We generally do not object to allowing the Commission Staff to inspect any generating facilities that we own or control and from which we expect to provide capacity or energy to APS or TEP pursuant to power purchase agreements. However, the process (including notice), scope, frequency, and consequences of these "inspections" is not clear. Such details should be fleshed out if the inspections are to be meaningful.

Thank you for your patience and consideration of our issues regarding this aspect of the Commission order and proposed Respondent Certification.

Sincerely,

A handwritten signature in cursive script that reads "Leesa Nayudu".

Leesa Nayudu
Origination Manager, Energy Supply

cc: AZ Competitive Power Alliance
APS
TEP
ACC Staff
Ernest Johnson
Chris Kempley